

# AVIATION

*The Oldest American Aeronautical Magazine*

JUNE 4, 1928

Issued Weekly

PRICE 20 CENTS



A W.A.E. Fokker F-10 landing at the Kansas City, Mo., airport.

VOLUME  
XXIV

NUMBER  
23

## Special Features

The Warner "Scarab"  
Naval Reserve Aviation  
The Aero Craft "Aero Coupe"

AVIATION PUBLISHING CORPORATION  
250 WEST 57 STREET, NEW YORK

Publication Office, Highland, N. Y. Entered as Second-Class Matter, Nov. 22, 1920, at the Post Office, at Highland, N. Y. under Act of March 3, 1879.

# The World's Fairchild Aeronautical Buying Power

*will center at your booth September 8 to 16*

AIRCRAFT and aircraft accessories manufacturers will have their first opportunity to exhibit their products in one great aeronautic pavilion during the aeronautical exposition which will be held in conjunction with the National Air Races at Los Angeles, California, September 8 to 16. Your products displayed in the most elaborate exhibition setting ever devised will be viewed by 1,500,000 air minded people.

Built of light steel and stucco the exposition building will measure 400 x 500 feet and will contain 200,000 feet of exhibition space in one huge room. The building will be of Spanish and Moorish architectural motif and will be the most beautiful exhibition structure ever used for aeronautical display.

Three landing fields totaling 2,200 feet wide and one mile long will be located alongside of the exposition building. Air-

plane manufacturers may fly their planes to the doors of the building, thus saving the cost of disassembling, freighting and re-assembling both ways. The landing fields are available also for demonstration purposes. This is the first time this feature has been offered to exhibitors.

The leaders of the aircraft industry are making exhibition space reservations by telegraph and air mail. If you haven't already done so get your application in today. This exposition has been sanctioned by the United States Aeronautical Chamber of Commerce, and will be one of the biggest aircraft shows of 1928.

You can market your entire 1929 output over the counter at this gigantic pageant of aeronautic progress. California Air Race Association, Telegraph or air mail Cliff Henderson, Managing Director National Air Races and Aeronautical Exposition, Ambassador Hotel, Los Angeles, California.



# FIRST Again ...



This plane is much the disabled Bremen—the Fairchild Cabin Monoplane

THE first plane to make the Beamer's crew at Greenly Island was a Fairchild Cabin Monoplane. No sooner was the distress of the disabled Bremen known, than C. A. (Duke) Schiller and De Louis Couillard of the Transcontinental Airways, Ltd., of Canada, volunteered to carry aid to the three hapless men . . . Baron Gunther von Huenfeld, Major Pitzmann and Captain Hermann Koehl.

Through almost a thousand miles of rain, snow, sleet and fog, the Fairchild plane plied its course from Murray Bay to Greenly Island. No more hazardous or unfavorable a flight could be contemplated . . . into the very jaws of disaster, many observers predicted. The Fairchild Cabin Monoplane, nevertheless, went through, and brought Major

Pitzmann back to Murray Bay for spare parts and special fuel for the Bremen.

Of the eight planes which subsequently flew to Greenly Island, seven were Fairchild Cabin Monoplanes. The respect with which experienced pilots consider Fairchild planes is typified by Duke Schiller's remark, when a Fairchild was suggested as the 'plane for his epic flight—'With that baby, we can go to the pole.'

As a result of the experience gained in building more cabin monoplanes than any other manufacturer—all Fairchild planes are ruggedly constructed for dependable service over land, water, or ice . . . through sleet, rain and snow, as well as in the hot soil air of the tropic zone. Fairchild Airplane Manufacturing Corporation, 270 West 36th Street, New York City.

SUBSIDIARY OF FAIRCHILD AVIATION CORPORATION

# FAIRCHILD



June 6, 1936



The Martin 74—  
all-metal, all-  
metal, three-passenger  
plane.

**ACCOMPLISHMENT** One year ago we announced to the aeronautic world an intensive and far-reaching program of research and development. The first achievement of this program is the Martin 74 (above) for which the U.S. Navy Department has placed orders totalling 103 planes—which sets new standards in virtually every detail of design, material and construction.

THE GLENN L. MARTIN COMPANY  
*Builders of Quality aircraft since 1909*  
CLEVELAND, OHIO



June 6, 1936



The Fokker F-2  
10-passenger high  
performance transport  
(13 Wasp)

The Loring Amphibian  
4-passenger cabin plane  
(2 Wasp)

The Lockheed Air Mail  
and passenger plane  
(Wasp)

## Versatility of the Commercial Wasp

The 400 H. P. "Wasp" is demonstrating a most remarkable versatility of application in commercial use. The "Wasp" is now installed in more than twenty various types of commercial ships, including land planes, sea planes, and amphibians, varying from the smaller individually owned four and five passenger cabin planes to giant tri-motor passenger and mail ships. In the service of one transport company alone commercial "Wasp" engines have been flown almost one and one-half million miles, carrying mail and passengers.



THE  
**PRATT & WHITNEY AIRCRAFT CO.**  
HARTFORD CONNECTICUT

TRADE TEC for reading AVIATION

## SPERRY BEACON SAVES FIVE PLANES AT BATTLE CREEK



BATTLE CREEK CHAMBER OF COMMERCE  
BATTLE CREEK, MICH.

Sperry Gyroscope Co.,  
Incorporated, Bridge Plaza,  
Brooklyn, N. Y.  
Manufacturers

The Sperry Beacon which we purchased from your company last year has been used in connection with many instances where the thought was held to be necessary in locating down or stalled aircraft. It is now standard.

During the winter of the past year five planes have received aid through the use of the Sperry Beacon. In one instance of these planes in the parking lot of the airport at the heavy snowfall of December 21, 1938, the pilot lost his way in the darkness and was unable to find his plane. The Sperry Beacon showed him exactly where he was in the darkness and enabled him to get back to his plane.

These were outstanding occurrences, in our opinion of the frequent occurrences of airplanes in winter storms. We feel that bid commercial interests by citizens and tourists would be greatly aided by the use of the Sperry Beacon in saving the flight from the present to the status of safety again.

These facts are presented, underscoring the opinion expressed by our Elkhorn Chamber that a dependable beacon should be given due weight in the equipment of airports.

The above points have been reported with great satisfaction from various sources in the case statements other than giving out the changing of lamps.

Yours very truly,  
BATTLE CREEK CHAMBER OF COMMERCE  
R. L. HABERMAN  
Secretary

SP-147



THE SPERRY GYROSCOPE COMPANY  
LONDON BROOKLYN, NEW YORK TOKYO

CLEVELAND  
Rotating Service  
SKF Industries

LOS ANGELES  
SKF Industries  
Engineering Co.

Representatives in:

NAN FRANCISCO  
Marine Building  
214 Market Street  
San Francisco, Calif.

PHILADELPHIA  
214 Market Street  
Philadelphia, Pa.

BOSTON  
220 Newbury Street  
Boston, Mass.

THANK YOU for reading AVIATION

ANOTHER ONE OF THE MANUFACTURERS IN THE AVIATION INDUSTRY  
THAT USES SKF BEARINGS AS REGULAR EQUIPMENT

## AEROMARINE STARTER CO.



April 26, 1938.



## Reliability at High Speeds Proves Worth of The Highest Priced Bearing in the World

**H**IGH speed and unquestioned reliability of SKF Ball Bearings are important factors in the success of the Aeromarine Inertia Starter. From the very beginning, the makers of this outstanding contribution to aviation have relied on SKF. Every bearing is an SKF—a total of eight!

Just why SKF Bearings are stand-

ard equipment on this starter is evident when the Chief Engineer says, "While the normal speed of the flywheel bearing in this machine is 14,000 R. P. M., each starter on its routine test is run at about 18,000 R. P. M. The run-down time is taken on each machine and this is a very sensitive index of any undue friction losses in the bearings."

You can also plan, build, and pay for machines of any kind, certain that SKF bearings will contribute a factor of safety that no other bearing can offer. **SKF BEARINGS ARE THE HIGHEST PRICED IN THE WORLD.**

SKF INDUSTRIES, INCORPORATED, 40 East 34th Street, New York, N. Y.

# SKF

Ball Bearings Roller Bearings

THANK YOU for reading AVIATION

## A NEW TRAINING PLANE



## The Curtiss Fledgling

THE FLEDGLING was constructed as the winner of a Navy design competition, in which fourteen leading aircraft manufacturers participated.

It is specifically designed for primary and advanced training, either as a land

plane or as a seaplane, and is equipped for fixed and flexible gunnery instruction, radio spotting, and bombing.

In design and performance, the Fledgling is eminently representative of 1923 standards for training planes.

**The CURTISS AEROPLANE & MOTOR CO., Inc.**  
Offices: Garden City, N. Y.; Factories: Garden City and Buffalo, N. Y.



THANK YOU for supporting AVIATION



## PN-12 Breaks Endurance Record

—with the help of  
 **AERO MOTOR LUBRICATING OIL**

 Aero Motor Lubricating Oil was used rather than gasoline in the PN-12 on its flight that exceeded by more than 8 hours the former seaplane record flight record. It took off from the Philadelphia Navy Yard, May 30, at 2:10 p. m. (Standard Time), landing at 2:51 p. m.—May 30, or 16 hours, 1 minute, 13 4-5 seconds. Distance covered equals Los Angeles flight—full load 20,000 pounds  
view of front.

The Standard Motor, despite the fact that it was burning oil, used 23 gallons, or .0975 lbs per MPHHR. The total  Aero Motor Lubricating Oil consumed by both motors was 39 gallons, or an average of .008 lbs per MPHHR.

The oil that made this record was our regular No. 478  Aero Motor Lubricating Oil.

 Aero Motor Lubricating Oil, in all required grades, are available in many sections of the country. Write us for the name of the nearest dealer.



**TEXAS PACIFIC COAL AND OIL COMPANY**  
FORT WORTH, TEXAS  
THANK YOU for supporting AVIATION

# WHO'S WHO

in American Aeronautics

*1928 Edition*

## The Blue Book of American Airmen

Contains Over Two Thousand Biographies of

Airavators, aeronauts, aerospace engineers, aircraft manufacturers, aircraft accessories manufacturers, flying field owners, American aces, aeronautical instructors, inventors, aeronautical writers, sportsmen, men prominent in aeronautical affairs.

Price \$1.00 per copy

Lester D. Gardner,  
Aviation Publishing Corporation,  
250 West 57th Street,  
New York, N. Y.  
Remitted please add One Dollar for copy of Who's Who in  
American Aeronautics. (No extra for postage and handling.)

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

# Aircraft Berryloid — *Reliable as Air Mail Itself*

*That's why NAT uses Progressive Aircraft Finishes exclusively*



As inspiring as any slogan in the annals of the nation is the creed of the air mail so tersely expressed in the determined words—"the air mail must go through".

Naturally, materials like Berry Brothers' Progressive Aircraft Finishes are selected to play their part.

Voicing experience encompassed in 2,000,000 miles of successful operation, the letter at the left leaves little untold. Every member of the industry knows that there is hardly a tougher test for pilot or plane than day-in-and-day-out operation on routes like this.

Berry Brothers' Progressive Aircraft Finishes meet airmail requirements. Can more be said?

Progressive Aircraft Finishes carried  
in stock for immediate shipment by

JOHNSON AIRPLANE & SUPPLY CO.,  
DAYTON, OHIO



**BERRY BROTHERS**  
Varnishes Enamels and Lacquers  
Detroit, Michigan 1928-75th Anniversary 1903-1928 Milwaukee, Wis.

Manufacturers  
of Progressive Aircraft Finishes

The enterprise of "Lorraine" is an assurance of constant progress toward more powerful and more reliable aircraft.



# LORRAINE



## Aircraft Engines



More than  
5,000 engines are  
in service through out  
the world. They have been  
fitted to all the different types of  
planes and have established them-  
selves through their remarkable reliability.

In actual use they have more than equalled the  
remarkable success which they have had in the  
brilliant long distance flights of the past few years.

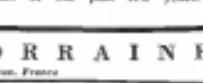
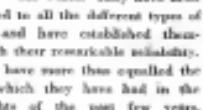
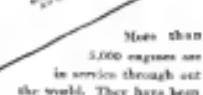
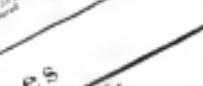


**SOCIÉTÉ**  
Faculté de l'Aéronautique



**LORRAINE**  
Nancy, France

1935, au Tribunal de Commerce de la Meuse May And. No. 21887  
THANK YOU for advertising AVIATION



# when the sun is blazin'

*and it's sticky  
down below*



THIS is the time for all good men to come to the aid of their comfort...with a Spalding Summer Weight Suit. For Spalding Summer Weight Suits have been designed by men who know all about the discomfort of sweating in overdone flying clothes.

Out of such warm understanding come suits that are as light as a wisp of cloud...as heavy as your propeller's backwash...suits that will give you much satisfaction



**Spalding  
Skeleton Helmets**  
Offlight weight leather. Unlined.  
For hot weather wear. \$3

as a perfect three point landing.  
One very popular model is made

*A. G. Spalding & Bros.*

NEW YORK  
165 Nassau Street

CHICAGO  
211 South State Street

SAN FRANCISCO  
154 Clay Street

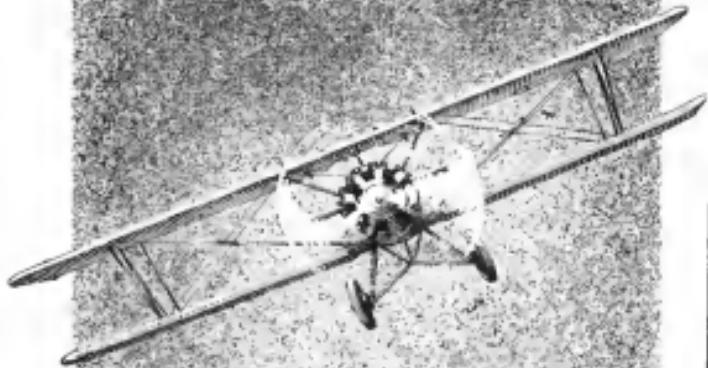
WRIGHT & DITSON, Special Distributors  
344 Washington Street, Boston

**Spalding Aviation Equipment is  
standard for the Army and Navy**

THANK YOU for advertising AVIATION



# The Consolidated Courier



**Consolidated Aircraft Corporation**  
Buffalo, N.Y.



THANK YOU for mentioning AVIATION



## Fokkers Serve Throughout the World

SERVICE, in an airplane, is derived from the design, workmanship and materials which have gone into its making. To the combination of these elements in Fokker Aircraft, their unceasing success in giving service under the most arduous conditions is due.

As a striking illustration, here is one out of hundreds of instances:

Lt Kappes made a world route from Amsterdam to Batavia and back, in a Fokker Trimotor. With no relief, Kappes and his crew of two made it in 10 elapsed days going, and 12 returning. Flying over 9,000 feet, and 10 hours. Total distance, 17,000 miles. Average miles per flying day, 900. Actual flying time, 27½ hours.

Perhaps no long-distance flight was ever crowded with such vicissitudes, disappointments and actual hardships. Again and again Kappes was caught dense fog, violent tropical rain and rain storms. Most of the way he flew over uninhabited jungles,

mountains, extremely hazardous terrain, and through crevices water jumps. He chose to fly blind through storms rather than risk flying in unknown territory. Several times Kappes in making the best of primitive landing fields became unmercifully saved. In Sumatra, a crowd of savagans, pulling the Trimotor from the mud, innocently broke a landing gear strut, dropping the right wing to the ground.

The flying qualities of the Fokker Trimotor can cred it to success through almost impossible flying conditions. Its unusual stability ensured safety even when flying blind. When bent by startup, repairs were made promptly, without special tools or workmen, due to the simple materials used in every Fokker.

It is always the same with Fokker Aircraft. Twenty-four nations use Fokkers and find them faithful to their trust in the discharge of the world's work — safe, swift, spacious, economical, the eminently perfect aircraft for commercial service.

Read for Our Special Edition of Our Book, *Rene Practical Considerations*.  
(Price is separately required.)

ATLANTIC AIRCRAFT CORPORATION  
Factory and Flying Field  
Tuckerton, New Jersey, U.S.A.

Subsidiary of FOKKER AIRCRAFT CORPORATION OF AMERICA, Wheeling, West Virginia



THANK YOU for mentioning AVIATION



## U.S. Navy's latest Martin Bomber BENDIX equipped

The Navy Department specified Bendix equipment for this latest development for bombing and torpedo work—Model T4 M-1, built by The Glenn L. Martin Company of Cleveland.

This plane is the result of intensive work carried on by the Navy Department and the Martin Company. It is equipped with the newest ideas in emergency flotation, catapulting, and arresting devices.

The Bendix installation is typical of the trend toward Bendix equipment on the part of the world's leading aviation engineers; based on these proved Bendix advantages

- perfect streamline
- high efficiency
- unusual strength
- light weight
- precision workmanship
- water-tightness
- Bendix standard size

**BENDIX BRAKE COMPANY**  
General Office and Plant: South Bend, Indiana  
Division of Bendix Corporation, Chicago

**BENDIX**  **BRAKES**  
FOR SAFETY

THANK YOU for advertising AVIATION

Adapted on  
ADVANCE WACO 10  
BOWING SOOTH  
CONSOLIDATED COURIER  
CURTISS FALCON  
CURTISS TRAINING  
DOUGLAS BOMBER  
FAIRCHILD CLOSED CABIN  
MARTIN NAVY BOMBER  
REAN DROUGHTHAM  
TRAVELAIR CLOSED CABIN  
VOUGHT CORSAIR  
U.S. ARMY AIR CORPS  
(for all ships)

June 4, 1932

## AVIATION

The Oldest American Aeronautical Magazine

Ernest D. Gruening, Publisher  
Lester D. Gorham, Executive Editor  
George Newland, Production Manager  
Alfred F. McElroy, Art Director  
E. Robert Bowen, Jr., Editor  
Richard H. MacCloskey, Associate Editor  
Herbert F. Powell, Associate Editor  
David J. Lester, Art Director

Vol. XXIV June 4, 1932 No. 23

### Index to Contents

EDITORIAL	1583
NAVAL AIRSHIP AVIATION	1585
THE WARREN "SCORCH"	1586
THE AUTO CRAFT "AERO-COTTAGE"	1589
HOUSING FOR THE EQUIPMENT FOR AIRPORTS	1591
THE "STARLING" biplane	1592
AEROPlane RACING PRACTICES TO MILITARY	1593
DERRIDA	1596
NEWS	1602 TO 1625
ENGINER SPECIFICATION TABLE	1626
LATE MOTIVE DRIVERS	1626
SEE ALSO	1627
PENINSULA NEWS	1628
AIRPORT AND AIRWAYS	1628
ROUTE TO ADVERTISING	1622

### AVIATION PUBLISHING CORPORATION

Business and Editorial Offices  
256 West 32nd St., New York City  
Cable Address: AEROCEN

Publication Office: Springfield, New York

Subscription Office: Springfield, New York, U.S.A.  
Subscription rates per year, Canada, one dollar; Foreign, one dollar. Single copies, 15 cents each. Subscriptions sent to non-resident countries should be sent by air mail or registered mail. Postage will be paid by the subscriber. Postage paid at New York, N.Y., and at Springfield, N.Y., and at Rockford, Ill., U.S.A. Copyright 1932 by Aviation Pub. Corp.

### For Your Convenience in Subscribing

Please send AVIATION to

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_

Enclosed find check (\$3 money order) for \$\_\_\_\_\_

THANK YOU for advertising AVIATION



The Lockheed "Air Express",  
powered with Pratt & Whitney  
400 horsepower "Wasp" Engine

  
equipped with  
**SCINTILLA**  
*Aircraft Magnets*



**SCINTILLA MAGNETO COMPANY**  
SIDNEY, NEW YORK  
Contractors to the U. S. Army and Navy



# AEROVANE

## An Aid to the Air Traveler

WITHIN the next twelve months, Aerovanes will be erected along the main highways leading out every city and town in the United States — making it possible for you to instantly locate your position from the air anywhere at any time.

Consisting of a structural steel pole six inches in diameter and twenty-five feet in height, the Aerovane contains the three fundamentals essential to the proper guidance of the flyer —

A wind cone three feet in length enclosed to the very tip of the pole, below this, centered on a horizontal plane, is a large arrow pointing and a half feet in length — with the name of the town towards which the arrow is pointing lettered in black on a brilliant chrome polished background.

On the tail of the arrow, which is a three-foot square, is superimposed a smaller arrow in white on a faded purple pointing into North.

Aerovane will be placed on the right side of every main highway on the outskirts of all cities and towns. Under normal conditions the Aerovane will be visible to the flyer at a height of 3,000 ft., and readable at a height of 1,000 ft. Arrangements may be made to illuminate the arrow and signs at night.

We invite inquiries from pilots, airports, airport committees, aero clubs, Chambers of Commerce, municipalities, and other interested in aviation.

# AEROVANE UTILITIES CORPORATION

292 Madison Avenue

New York, N. Y.

THANK YOU FOR ENTHUSIASM AVIATION

# AVIATION

*The Oldest American Aeronautical Magazine*

Vol. XXIV

JUNE 4, 1928

No. 23

## Speed Ranges

THE NORMAL speed range of present day aircraft is roughly two to one, that is, the high speed is about twice the landing speed. By increasing the landing speed by ten miles per hour it is possible to increase the top speed by ten miles per hour and in general most designers have gradually increased their landing speed in order to gain high speed. There is, however, a limit to this increase even if planes are flown from excellent fields and are handled by expert pilots. Then it comes to planes which are to be handled by inexperienced fliers and from poor fields it is almost unnecessary admitted that we have already reached landing speeds which are too high.

The simplest expedient for increasing the speed range is to increase the reserve power. Certain racing planes have a speed range of more than three to one, but with present day engines such reserves are hardly practicable and the fundamental problem presents itself of either decreasing the resistance of a given wing section or of greatly changing the shape of the section by mechanical means. The later method seems to indicate the most promising results but the mechanical difficulties involved are extremely difficult to overcome. That no suitable very mechanical means of obtaining such speed ranges has been generally adopted does not mean that it never will. The competition for the Guggenheim prize should bring out many new ideas and it is earnestly hoped that some method will be found that will check the present tendency towards high speeds in landing.

## Civilian Engineering

THE NATIONAL Advisory Committee for Aeronautics now has one of the best equipped laboratories for aerodynamics research in the world. In addition it has pilots who are accustomed to flight testing, and also it has developed a series of instruments for recording figures that are unique.

Heretofore our efforts have been directed toward pure research and the solving of the problems which are met in the design of ordinary craft. With the growth of civilian aviation the N.A.C.A., which is established by the government for the purpose of serving the "people," should turn its attention more to the specific problems which affect commercial aviation. One of the first of these which might be gene out is the question of comfort for passengers. Instruments could be developed to measure the sounds in the cabin of closed planes. Various experiments with mufflers, geared propellers and padded

walls could be tried. And manufacturers could send their products to Langley Field and have actual tests made of the volume of sound in their planes.

Then there is the matter of ventilation in the passengers' cabin. This subject has never been scientifically studied as far as aircraft are concerned. Maintenance of atmosphere in the streams which can be passed on airplanes due to very bumpy air such as is found in transoceanic flight is also a matter of great importance which very little is known. The foregoing subjects, probably a civilian problem, is another subject which needs considerable study. The N.A.C.A. is already studying this problem.

The above are but a few of the many problems which could be suggested or needing study in the civilian angle. At the moment the matter has recently at Langley Field, the N.A.C.A. advised that it was anxious to tackle some of these problems, and it is up to the builders of civilian aircraft to formulate their needs. There is no doubt that the N.A.C.A. has the equipment and personnel to tackle jobs which would be impossible for the individual manufacturer to undertake, and there is also little doubt that the manufacturer who takes advantage of these facilities will have a valuable adjunct to his own engineering staff.

## A Good Policy

A NOTEWORTHY sales policy was established by the German Aircraft Corp., when that organization turned down an order sent in by the German avatrix, Miss Thora Baude, for a Stinson-Detroiter to be used by her on a West-East trans-Atlantic attempt some time during the coming summer.

The Stinson company is to be highly commended for its inaugurating of such a policy, for, regardless of the fact that one of its planes has successfully accomplished a West-East Atlantic flight, it has been more or less proven that the safety factor of a single engined plane over the North Atlantic stretch is very small indeed. Why then should the Stinson company lend itself to a venture which, even if successful, would add very little to its name, and how to the advancement of commercial aviation? The Stinson sales force has to take the blame. In the opinion of an exceedingly worth-while company — to keep single engined planes off the Atlantic and Pacific, it is to be hoped that other manufacturers of possible trans-oceanic planes powered with but a single engine will follow the lead of the Stinson company and adopt a similar policy.

# Naval Reserve Aviation

Since its Inception in 1923, 175 Men Have Been Trained and Four Reserve Aviation Units Have Been Established

By JAMES P. WINES

**D**ECLARATION OF the existence of a national emergency will be all that is required to increase the strength of the United States Navy ten aircraft squadrons, which will be ready for action practically overnight. This addition to the country's war-time fighting strength will be made possible as the result of a program now being carried out by the Navy Department for building up an active, well-trained air reserve.

Under the present plan, the reserve aircraft squadrons are not to be separate organizations. The officer complement is rapidly being filled, likewise, the enlisted personnel are being recruited and trained. When the program is completed, the Navy will have 30 aircraft squadrons that may be mobilized "in case of national emergency" within 24 hr., offsets of the department say.

Since 1923 the Navy has been training aviators for this purpose. In these five years, 175 men, almost all of them college graduates, have completed a special course and have been commissioned ensigns in the United States Naval Reserve with designations as naval reserve aviators. Twenty more are expected to have qualified by the end of the 1928 summer training period.

Upon completion of the course and as soon as these men possess their commissions, they are assigned to squadrons for further training. Officers of the department are frank in admitting that the plan has not yet progressed far enough to allow the training of the personnel of each squadron as a whole; however, rapid strides are now being made in this direction and it will not be long before this is accomplished.

The plan of establishing an active reserve aviation force was conceived in the Bureau of Aeronautics in the autumn of 1922, an officer holding an important position in the Bureau of Navigation held a representative of AVIATION, Lieut. Cmdr. Richard E. Kyrd, Henry B. Clegg and Victor Blumster were the originators of the plan. John W. A. Moffett,

chief of the bureau, supported it to the point of getting appropriations made. In the Bureau of Navigation, who handles all matters pertaining to personnel, Capt. K. M. Barnes and Cmdr. J. A. Schubold prepared and supported measures that would allow the program to be carried out.

Later came the present plan of building squadrons for mobilization on such. The late Lieut. Cmdr. Ned Davis was responsible in part for this. Before his death the post he occupied in the Bureau of Navigation has been held by Lt. Cmdr. Claude E. Field. Mr. Field, who has participated in the work of the Bureau of Navigation, has been associated with the Bureau for a number of years. He is a graduate of the second class at Pensacola and holds a naval aviator's designation bearing the number "38." He has contributed largely to the present development of naval reserve aviation.

"Little need be said of the work of Capt. G. R. Tracy, who is director of Naval Reserve Aviation, and the others who are being trained. "He is too well-known to require much comment. While aviation is only a part of his job, he has been tremendously interested in its development in the Bureau of the Reserve and he is responsible to a large extent for the success with which the plan is working."

No time was lost by the Navy Department after the formulation of the plan for the organization of the aviation reserves. In 1923 two Naval Reserve Aviation units were established and the training of the first classes of reserve student aviators was started. One of the units, or bases, as they are now known, was at Fort Hamilton, N. Y., but it was later moved to the present site at Rockaway Beach, L. I. The other was established at Gloucester, Mass. As the program expanded upon, two more units were created. The third was established in 1924 at Great Lakes, Ill., and the fourth at Ford Field, Wash.

The Reserve Aviation units are the primary training schools for student naval reserve aviators. These bases are really small naval air stations. Each is located on a sheltered half of water where no planes are landed. At one or two of the units, landing fields have been cut and new ones are. There are rigging and maintenance shops at each so that the planes may be completely overhauled. Hangars, barracks, office

and mess halls have been erected also. In many cases, these buildings are only temporary structures, this is true, for example, of the base at Ford Field, the last of the four units to be established.

In the past, the grand old "N-9," the type of seaplane in which many famous naval aviators made their first flights,



The Naval Reserve at Pensacola in the early days of naval aviation.

and the local Navy Yard, the commanding officers of the naval air stations at Hampton Roads and San Diego and the commanding officers of the four reserve units.

"Training agreements are preferred, in general, because they permit the officer to have for a longer period of time the better facilities." The agreements must be college grants-in-aids, the funding colleges with the exception of graduate students, or possess the equivalent of a college education. They must be American citizens, and they must have their permanent residence in the city in which the aviation division is located to which they will be attached after completing the training and receiving their commissions.

"In addition to the ordinary physical examination, all student aviators, before being allowed to primary flight training, must have passed a flight physical examination within six months of the date that they report for flight training. Requests for waivers of physical defects for student aviators will be as far as can be granted. If a naval flight surgeon is not available in the locality, an examination by an Army flight surgeon will be incurred, providing satisfactory arrangements can be made readily to have him conduct the examination.

## Length of Ground School Varies

"The complete course of training for student aviators, leading up to a commission as ensign in the United States Naval Reserve, consists of the preliminary ground training, primary flight training and advanced flight training. The preliminary ground training is conducted while the students are on inactive duty. Lectures are held once or twice weekly, or oftener if desired. The length of the ground school course varies according to the frequency of the lectures. If the lectures are given twice weekly, the course should cover a total of 150 or 160 hours.

"After the students have satisfactorily completed the ground school course, they are eligible to be sent to the nearest reserve aviation unit for primary flight training. This course consists of 45 days' training duty with pay and allowances. The



Captain John D. Duran, commanding officer of the Reserve Aviation Unit, Gloucester Beach, L. I., N. Y., directing the work on an "N-9" seaplane.

student is given approximately 10 hr. instruction in flying elementary types of seaplanes, followed by 30 hr. solo flights in the same type. Students who satisfactorily complete the primary flight training are eligible for the advanced course, which likewise consists of 45 days' training. In this course the student is given approximately 50 hr. flying in advanced types of seaplanes, ground and aerial machine gun work, bombing exercises and navigational flights. Immediately following the completion of the advanced flight work, he is examined professionally for his commission."

The ground school course for student aviators is now being conducted at 10 universities and colleges throughout the

Continued on page 1622



Planes ready to be "put over the side" at the Reserve Unit located at Gloucester, Mass. Two planes can be seen in the water.

# The Warner "Scarab"

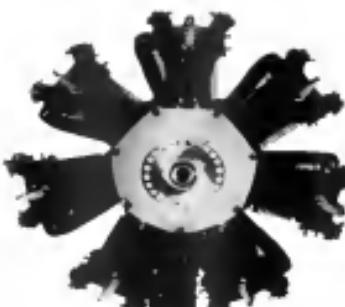
New Seven Cylinder Radial Engine  
Rated at 110 Hp. at 1850 R.P.M.

**A**PPROXIMATELY ONE year ago the first Warner "Scarab" seven cylinder radial engine was completed and submitted to its first 90 hr. test. Later, after 126 hr. of testing on the torque stand, that engine was installed in a "Travel Air" biplane and has been in service ever since. The first engine was built on the shop of the Hobo Adams Corp. & Brass Corp. of Detroit and, after successful tests were completed, the Warner Aircraft Corp. of Detroit, Mich., was formed, with Hobo Adams, president and general manager, W. O. Warner, vice president and chief engineer, Nelson Hartwick, treasurer, and W. J. Davis, secretary. However, it was not until February of this year that the second experimental Warner engine was completed. It was this engine which was submitted for test by the Department of Commerce and later was the second recommended engine to be approved by that Department, the first being the Fairchild-Darwin.

The Warner Aircraft Corp. is now putting into production



Front quarter view of the "Scarab" showing the Stromberg carburetor and the two Bremont magneto.



Front view of the Warner "Scarab" engine

and has started taking deliveries. The first production engines were delivered for installation in the Grinnell Junior monoplane, the Paramount Colibri and the Aero-Coupe. The fourth company to standardize on a plane with this engine is the Reid Aircraft Co. for the Fair Junior. It is understood that the entire output has already been contracted for. The output is now approximately 10 to 12 engines a month and will be increased immediately until it is up to 20 a month. The engine sets for \$250.00 and the cost of the engine is estimated by W. O. Warner at October 1926. New, after much testing and after a number of changes, productive in many ways, the engine is a seven cylinder, water air cooled, radial of conventional design rated 110 hp. at 1850 r.p.m., though it has developed 122 hp. at 2000 r.p.m. Dry, without starter or belt, it weighs 270 lb. or 2.65 lb. per rated hp. The compression ratio is 6.2 and it operates at a mean effective pressure of 132. The displacement is 625 cu. in. and the bore and stroke 4.25 in. by 4.25 in. It is stated that the specific fuel consumption at full throttle is .487 lb. per hp. hr. or full gal. per hr. and the oil consumption is .098 lb. per hp. hr. The engine is quite small and presents a very clean appearance. The overall diameter is 35.6 in. while the overall length is 32.75 in. All accessories are mounted on the rear and, according to Warner, decrease with a view to minimizing the amount of time required for maintenance and to make it comparatively easy to dismantle the engine.

#### AC Spark Plugs Used

Cylindrical barrels are chrome molybdenum forgings, while the heads are of Beta aluminum alloy. Adequate cooling fins are provided; they extend over the head and around the valves. The combustion chamber is hemispherical with two valves, one intake, and one exhaust at the sides, and with two AC spark plugs, one in front and one in back, latter readily removable. Aluminum bronze valve seats are driven into the heads; the two valves are of the intake type of 6 deg. apart. They are 156 in. in diameter and have a lift of .486 in. The intake valve is of tungsten steel while the exhaust valve is a solid alloy. The double valve system is

Continued on page 5530

# The Aero Craft "Aero Coupe"

All-Purpose Three Place Biplane is Powered with a Warner "Scarab" Engine and has a High Speed of 115 M.P.H.

By JOHN T. NEVILL

AERO CRAFT Manufacturing Co., the latest addition to Detroit's aircraft industry, recently completed their first production in three planes, monoplanes under biplanes, known as the "Aero Coupe". The tests were made by Capt. Clement W. Brown, president, and Capt. Carl E. Soper, manager of the company. The plane, Captain Brown said, was in production so soon as the tests were accomplished. The company exhibited its craft for the first time publicly at the All-American Aeroplane Show, recently held in Detroit, because of the speed with which it was assembled for the show, it was deemed advisable to re-assemble the plane before flight tests were made. A second plane of the same model is nearing completion.

The Aero Coupe is an all purpose biplane, intended especially for fast express or air mail feeder line service. It was designed by Captain Brown and Captain Carl officers of the 167th Observation Squadron, Michigan National Guard, and World War Army Doughboy Fighters, formerly with Grinnell Aircraft Corp., and the Grinnell Aircraft Manufacturing Co., did the engineering work.

The Aero Coupe is a biplane designed with a Clark Y airfoil section. The wings have no taper, neither in plan form nor section. Rectangular spars span and flange type cross ribs with plywood gussets, comprise the principal wing skeleton. Three bags are made in the main bracing, which is double and made of square section steel. MacWhitney rods are planned for use in forthcoming models, although wire and turnbuckles were used in the initial product. Drag struts are of spruce with cold rolled steel fittings. The wing web and cap strips also are of spruce. The leading edge, top and bottom, forward of the front spar is covered with dust cloths, the trailing edge being a triangular section

of sheet aluminum. The wings are covered with Flights, the future being machine sewed and attached by the "sew-cut" method. Five coats of clear dope and two coats of orange Berry Brothers lacquer, complete the finish on the wing surfaces. All woodwork on the wing interior is varnished, the fittings being protected with Berryloid red oxide paint.



Front view of the "Aero Coupe" powered with a 110 Hp. Warner "Scarab" engine.

ailerons. Exterior wing struts, as well as those of the undercarriage and stabilizers, are aluminum plated and streamlined. Wing fittings on the Aero Coupe are all lathe cut and of conventional design. The wings are wired for lights in radii and the plane is equipped with running lights. Wings are constructed of all wood surfaces. The skeleton of the counteracting balance type are of narrow chord, comprising but 12 per cent of the wing surface. They are hinged to the wing at the bottom of their leading edge, the pig is to the upper surface being closed by a sheet of dacronite, making the joint as streamlined as possible.

Continued on page 5527



Clement W. Brown, president of the Aero Craft Mfg. Co., standing at the wing of his company's new product, the "Aero Coupe".

# Bowser Fueling Equipment for Airports

By C. P. GRIFFITH  
*Civil Engineer, A. F. Bowser & Co.*

**T**HE FIRST step taken by A. F. Bowser & Co., Fort Wayne, Ind., in the task of developing a suitable type of stationary equipment for aviation fueling purposes, was to study the existing conditions. The company's officials consulted experts in commercial aviation, and tested their conclusions in order to determine just what the conditions were that must be met, and what type of equipment would best meet those conditions, not only at that time but also in the future.

From this study a number of fundamental requirements seemed to stand out:

1. Ability to deliver fuel quantity desired in a steady stream at the point of delivery.
2. Spend to minimize favorably with the speed now available in fueling automobiles.
3. Positive control at the point of delivery to avoid over-fueling tanks and fire hazard.
4. Accuracy in measuring fluid delivered.
5. Elimination of moisture, water and dirt from gasoline.
6. No ground hazard.
7. Large serving radius.

While all of these features may be present or greater or lesser degree in either stationary or mobile equipment, there are certain fundamental differences between stationary and mobile equipment which should be considered.

## Stationary

With stationary equipment, place must be found or taken in fueling point.

Stationary equipment uses tankage for storage and fueling purposes.

Continuous fueling capacity limited only by size of storage tank.

Low initial cost.

Low depreciation.

Precisely as airplane requires.

May be identified as serving point from the air to visiting planes so that in landing they can taxi in position for service.

No ground hazard when properly designed.

## Mobile

With mobile equipment, service may be taken to the plane. There must be storage and pumping equipment by means of which the mobile equipment can be filled.



Diagram showing the installation of the Bowser fueling system.

Any mobile outfit is limited in storage capacity and necessarily in fueling capacity without replacement.

High initial cost.

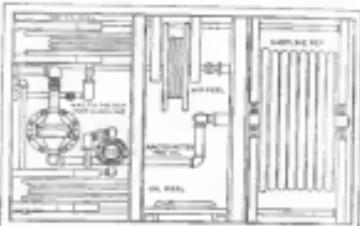
Heavy upkeep expenses.

Large depreciation.

Difficult to keep in one piece together.

Costs up flying field.

These considerations convinced Bowser & Co. that there was a need place for a suitable type of stationary equipment for



Details of the nozzle of the Bowser fueling pit for gasoline, oil, water and air service.

aviation fueling purposes and the equipment described in this article is of that type.

It consists of one or more fueling points on the flying line centered in a social water proof box deck with the central level, connected to a pumping unit located in the hangar or oil house.

Each pit or fueling point has a fueling coverage of a circle 160 ft. in diameter with the pit in the center and is constructed so that when the covers are closed, no ground hazard is offered and planes can taxi directly over the pit.

In the pit is located a base rod accommodating 50% of gasoline hose. The hose is full of gasoline at all times and

Continued on page 3236

# The "Starling" Biplane

A Three Place, Open Cockpit Biplane of Conventional Design and Construction Powered with an OX-5

By H. A. LINDBERGH

**T**HE STARLING<sup>27</sup>, which is manufactured by the Starling Aeroplane Co., is the second plane to be built in Indianapolis. Made in quantity production, the first set built by the Mahank Aeroplane Co. produced the 1926 model. Although the first Starling is powered with an OX-5 engine, a detachable engine mount is provided so that any type up to and including the Wright Whirlwind may be mounted if desired. This new production plane is a three place, open cockpit biplane of conventional design and construction.



Fast quarter view of the "Starling" powered with an OX-5 engine.

dimensions, having a steel fuselage, wood wings, split type landing gear and other general features of construction common to the type of light conventional plane.

The first Starling was officially test flown recently by Oscar Black at the Wold-Chamberlain Airport, during which the plane took off after a comparatively short run, climbed to about 400 ft. in the first minute and was then put through a series of maneuvers to test the construction. The action of the plane under severe conditions. The Starling was found to be under control and all flights had results which were in accordance with tests previously effected. Leslie H. Blackman to the designer of the Starling.

As in a large percentage of the planes built in this country the fuselage and the tail group are built up with welded tubing, the fuselage being of Pratt truss construction. The horizontal stabilizer is adjustable in flight with Austin wire being used, as well as for the ailerons and the rudder. The rudder is actuated by cables controlled by foot pedals. No pulleys are necessary on any part of the plane for the various controls. The tail is of wood with a steel tube at the end wrapped in cambray and held being parallel to the end of the fuselage for emergencies.

In using a modified Aeronca section for the lower wing it is claimed that a fast tail up the nose is possible, while a modified Clark Y section for the upper wing gives better maneuverability and a higher top speed. The upper wing is three parts, a flat front center section with two outer panels while the lower wing is built up of two panels. The upper wing construction is constructed with wood ribs and metal spars, the leading edge of the upper wing being made

of aluminum while that of the lower wing is plywood. Hand brakes are provided on the forward end of each panel of the lower wing for ease in landing on the ground. The cables and struts are of the S type made of nickel plated tubing and stainless wires are used for bracing. The center section is wide enough so the center struts, attached to the upper fuselage longerons, can be placed in such position as to allow ready access to the passengers' cockpit, and in addition the interference with the pilot's forward vision is also greatly reduced.

The engine pilot's and passengers' cockpit are completely enclosed and the seats are fitted with comfortable cushions. Both the windowsills are so arranged that the windows can be tilted without protruding far yet not too large as to add too much unnecessary parasite resistance. To the rear of the pilot is a 26 in. by 34 in. by 14 in. baggage compartment. Right or left throttle is optional with dual control being standard equipment. Instruments as required by the Department of Commerce are furnished, including the first oil and fuel flow indicators. The fuel tank, instead of being short as is customary in most planes, tapers as the tank body from the end at the pilot's cockpit to the vertical fin. As it is true with the majority of the latest production planes, a door is provided on the left side of the fuselage to allow quick access to the passengers' cockpit.

The radiator on the OX-5 model is placed in the nose of the fuselage to eliminate the otherwise parasite resistance and in addition this feature of construction enhances the general appearance as well as reducing to a minimum the interference



Side view of the three place OX-5 powered "Starling" biplane with the forward vision of the pilot. The engine bell is built up of sets of sets of steel longerons, links being hung under the frame of the mounting bolts and under the engine deck while heavy steel springs are placed under the rim of the engine to dampen engine vibrations. A 40 gal gasoline tank is mounted in the fuselage immediately in front of the engine in such a position that positive gravity feed is possible. Through this arrangement of mounting the tank in the fuselage instead of under seas in the wings, it is possible to build a more uniformly stable plane in that it is near the point where all weights are centralized. A Blomhoff wood

Continued on page 3236

# Applying Racing Practices to Military Designs

By TEMPLE JOYCE

**WITHOUT DOUBT,** the British last year, proved that with the best brains available on the air cooled and water cooled engine fields, as far as high speed racing results are concerned, the water cooled engine still stands the lead. The reason for this evidently is due to the particular design of the air cooled engines to contain the radial design in its original form, which due to its large projected areas is in proportion to properly cool the engine, and consequently to have a much smaller projected area than the all projected area, water cooled engine. The reasons, however, obtained with the British De Havilland "Tiger Moth" with an air cooled engine shows promise of possible improved results along lines other than the radial type. Unquestionably at speeds under 200 m.p.h., the radial air cooled engine performs satisfactorily of power concentration and performance that tend towards a vastly superior product for all around use. Where speed alone is desired, and all other factors such as maneuverability, manucom, vulnerability, are considered of minor importance, the water cooled engine stands paramount.

If this premise is correct, then it is very easy to assign the two types of engines to their respective military duties, as we will know that during the war there existed two classes of pursuit—the light, highly maneuverable combat dog fighting type, generally used against the smaller, slower dog fighting type, generally used against the larger, faster, and the high-speed, exceptionally sturdy job capable of flying at high velocities, more or less known as the "bomber type."

These two types of airplanes required not only distinct differences in the manner in which they were flown but actually

another day". In other words, he maneuvered curiously, a ways into a position of advantage before making his entry by using, a dive from superior altitude, the use of his bank, turns, dives, or deploying a dive upon whom the enemy would concentrate, thereby drawing attention from himself.



A Curtiss "Hawk" powered with a Curtiss D-12 engine.

I do not mean by this that the combat type of pilot did not sometimes use the same methods at the beginning of an encounter, but the difference is that after the high driving up of speed had been fired off on the enemy, due to the extreme high speed and lack of maneuverability it did not stay to combat; whereas the highly maneuverable aircraft, if it missed its first attempt of flying would immediately evade and continue combat until one pilot extraneous, the other will brought his opponent down. If the high speed machines when it is within 200 or 300 yd. of its objective is detected by the pilot in the other plane, there is no doubt that an attempt is immediately lost because it cannot maneuver in time sharply enough to keep its guns on the enemy, nor can it stay to cover because of the danger of being discovered, therefore it must withdraw and wait for another opportunity for surprise attack. I do not bring here only the offensive angle of these two planes, the defensive side is different.

As a majority of the pilots during the war were taught down from surprise attack, whether by a high speed driving type of plane or the highly maneuverable, it is evident that the latter will be forced to the same dead of effecting to be faster in an encounter. It is also noticeable that the higher the speed of a plane the greater chance it will have to possess of its enemy without being detected.

This has only to get into the air and operate at around 10 thousand feet over on the instant of days trying to keep up on a number of machines that are operating in his vicinity, to realize how difficult it is to know what sort of maneuver is being, where they are going, and to later plan the next or another pass in their flight. One's ability to low-light



A note time Sopwith "Camel" powered with a 230 h.p. Clerget rotary engine.

from a war standpoint required pilots of a different temper and skill.

The highly maneuverable type of plane was generally manned by an individual who found nothing and was ready to sustain anything or any going regardless of number, partly for the love of the combat. He was exemplified in the young dashing type of British pilot. The high-speed driving type of plane was generally manned by a calculating braver type of individual, who had basis of his mind always the old saying that "he who fights and runs away, lives to fight

a plane in a very definite sector of the sky as surprising, and the rapidity with which planes at other times pass into your vision at close range from a sector of the sky that a minute before seemed absolutely clear is quite startling. These machines hold true at speeds around 180 m.p.h. during the war, and it is easy to realize how much more speeded they would be at speed of say 200 m.p.h. Imagine a condition where a group of fighting planes were traveling at the rate of 200 or 250 m.p.h., and the enemy with a squadron of machines capable of making 250 to 280 m.p.h., carrying only one gun and a small amount of ammunition, were operating in the same vicinity. The rapidity of approach of these planes would be so great that undoubtedly from time then they would open the 300 m.p.h. planes before they knew what was happening, and in many instances could fly directly into them, back to safety without shield, and at the same time stretched to the rear for long enough periods to adequately assure himself against surprise from that direction. In other words, it is just impossible for a pilot to look to the rear enough to adequately protect himself and at the same time carry on his other functions. This means that there are black periods when the tail of a single seater is not being watched, and a plane capable of making 280 m.p.h. would, during the course of a day's operations even where there are no clouds, have innumerable chances to pick off some machine without being detected or intercepted.

If we could passage another Western Front War with the British Forces having perfect planes of the class of the existing single-seat fighters, and the Allies had at their disposal, we shall say, fifty Supermarine Schneider Cup racers fitted with one machine gun very easily mounted, these planes could operate from a lake or river adjacent to the front, they could reconnoiter and carry out vital army reconnaissance, fly over enemy aircraft that happened to be sleeping within their paths, and never be touched by opposing armament.

The fastest speed of any existing pursuit plane today in a vertical dive is around 280 m.p.h. By the time it is flattened out, its horizontal flight speed drops below 250, which would mean that a squadron of supermarine rotary fitted planes as light pursuit planes could never be attacked if the pilot were slow; they actually could never be intercepted. The type of plane undoubtedly could and would not go to high altitude where it would be outmaneuvered and outperformed by the lightly loaded air cooled fighters, but there are many theories of aerial warfare that probably planes from going beyond 4,000 to 6,000 ft. each as some classes of photography, fast spotting, corps and army reconnaissance, bombing, airship recognition, etc.



The 120 h.p. Bristol "Fighting" biplane with a "D.H." in line, air cooled engine developing 230 h.p. which made a speed of 295.5 m.p.h.



A Fairey "Cormorant" powered with a Pratt & Whitney "Wasp" engine.

and wing like engine 425 h.p. water and air cooled engines, straining parts of the extremely high military loads and general requirements as the structure of the plane (which, however, would increase the production cost), speeds of more than 300 to 350 miles per hour, and the existing single seat records would be obtained. With additional study, it would decrease the size of the projected area of engines, increasing their power slightly, and possibility in the future, reducing the size of the pilot, limiting his weight in policy specifications, speeds could be looked forward to around 250 to 280 m.p.h. The discrepancy between the top speed and existing racing plane records of over 350 m.p.h., and use 1800 h.p. or more, whereas military types land around 60 to 80 m.p.h.

It is not recommended that the service adopt racing planes as standard single seat fighters, but racing practice applied to service designs will be distinctly beneficial. Any activity that will increase the performance of all the existing classes of planes whether single seat fighters, bombers, etc., as racing can and should do, ought to receive the unfeigned support of the military services.

### California Still Leads in Number of Planes

#### With Illinois New Second and Texas Third

A NEW compilation giving the status of aircraft in the country by states and corrected to May 1 has been issued by the Department of Commerce. The statistics show 3,838 registered, licensed, and temporarily numbered planes. The states have more than 100 planes; California being well in the lead with 595, Illinois second with 376, and Texas third with 244—leading New York's total of 243 by one. The other six states of the first 10 and their totals are: Michigan 230, Ohio 189, Missouri 175, Pennsylvania 165, Oklahoma 160, and Kansas 162.

The compilation follows:

#### STATUS OF AIRCRAFT BY STATES MAY 1, 1938

	Identified	Licensed	Number	Total
ALABAMA	1	1	1	3
ARIZONA	1	0	6	9
ARKANSAS	19	11	4	32
CALIFORNIA	371	314	204	993
CAROLINA N.	4	14	0	21
CAROLINA S.	3	1	0	4
COLORADO	8	9	0	24
CONNECTICUT	8	10	12	30
DAKOTA N.	16	9	2	18
DAKOTA S.	6	4	5	15
DELAWARE	0	4	2	6
DIST. OF C.OL.	0	38	0	38
FLORIDA	37	33	9	69
GEORGIA	16	9	5	30
IDAHO	2	3	7	12
ILLINOIS	75	121	78	274
INDIANA	34	12	52	98
KANSAS	29	34	8	61
KENTUCKY	38	17	20	105
Louisiana	38	8	12	58
Maine	1	6	3	10
MARYLAND	13	20	17	50
MICHIGAN	6	11	9	26
MONTANA	6	9	0	15
MINNESOTA	18	20	20	58
MISSissippi	1	0	1	6
MISSOURI	47	48	57	172
NEBRASKA	0	4	11	15
NEVADA	11	16	25	52
NEW HAMPSHIRE	0	0	2	2
NEW HENRY	5	25	24	54
NEW MEXICO	2	1	2	5
NEW YORK	43	42	117	242
OHIO	38	58	74	180
OKLAHOMA	16	12	41	109
PENNSYLVANIA	7	7	16	30
PENNSYLVANIA	95	92	45	232
RHODE ISLAND	3	0	0	3
TEXAS	128	47	90	244
UTAH	3	5	2	10
VERMONT	6	9	2	17
VERMONT	5	79	14	101
WEST VIRGINIA	0	0	5	5
WISCONSIN	18	34	21	73
WISCONSIN	96	22	39	157
WYOMING	2	4	7	9
ZEPHYRUS	1	0	0	1
ALASKA	0	0	2	2
TOTAL	3,838	3,288	1,000	6,126

### Junkers W-34 Plane Built for Australian Company Uses a Bristol Jupiter Engine

A BRISTOL Jupiter engine has been installed in a Junkers W-34 monoplane constructed for the New Guinea Gold Co., an Australian concern which is at present prospecting for gold in New Guinea. The gold mining area is about 15 mi. from the coast at an altitude of about 18,000 ft. There is no road or even a reasonable track, so that when the men are transported by airmen it is necessary for them to carry food for 30 days, allowing eight days to get there and eight days return. Part of the track over the mountains is a trail that men are obliged to hoof themselves up by means of ropes. As a result, the round trip by carrier is generally about three



New Guinea gold prospecting will be carried on in this Junkers powered Jules.

weeks, allowing one to sleep only a few hours, usual load. The round trip can be completed in about six hours, so that the miners should press a paying proposition. On this service there is no possible landing place between the two terminals. The W-34 is a low wing monoplane of duralumin non-corrosion, with both wings and fuselage covered with corrugated sheet aluminum. It is primarily a mail and freight carrier, with the pilot sitting in the open in front of the post box compartment of 300 cu. ft. An 80 gal. fuel tank is located in the center section. The plane has a span of 60 ft. 2 in. and a length of 36 ft. 9 in.; the wing area is 933 sq. ft. The W-34 weighs 3,320 lb. empty and carries a useful load of 1,200 lb. giving it a total weight of 4,520 lb. It has a high speed of 127 mph. and a cruising speed of 100 mph. It lands at 55 mph. and climbs from 2,000 ft. to 10,000 ft. in 10 minutes. The ceiling is 18,700 ft.

### George Titterton Is Now Project Engineer

Of Keystone Aircraft Corp., Bristol, Penna.

GEORGE TITTERTON has joined the Keystone Corp., Bristol, Penna., as project engineer. He is the 30th graduate of New York University as the product of a series of studies on stress analysis sponsored by Keystone. Before this time he was in the engineering department of the Bureau of Aeronautics, Navy Department, at Washington.

### Gray Goose Airlines, Inc., Offers a 55 Mi.

Sightseeing Trip Over Chicago Twice Daily

A 55 mi. sightseeing trip over Chicago is now offered daily by the Gray Goose Airlines, Inc., of that city. The Ford-Ghost, in-line-engined plane of the company, which seats 14 passengers, leaves the Chicago Municipal Airport at 11:30 A.M. and 8:30 P.M. each day. Night flying will be booked whenever desired by patrons, officials announce.

June 4, 1938

AVIATION

### National Model Airplane Meet Scheduled

To Be Held at Detroit, Mich., June 29-30

Model THLAs a thousand boys from every place in the United States between Portland, Maine, and Honolulu are expected to participate in the National Model Airplane Contest to be held at Detroit June 29-30 by The American Flyer Magazine. This magazine, which organized the Airplane Model League of America, and has built an membership up to more than 350,000 in eight months, has been designated as the National Aeromodel Association to conduct the contest. Short Takeoff, the Model Airplane Division, and the new scale model competition.

Short Takeoff, the newest division, is the project of the Model Airplane and Charles Dyking, Director, of the Short Takeoff. Participants enter in these contests try to land as far as possible from the starting point. The winner of the scale model contest, to be held for the first time this year, will be taken to Los Angeles to attend the National Air Races. There are also \$1,000 cash prizes and \$600 medals to be presented.

#### Many Newspapers Cooperating

Many of the entrants in the contest will be sent to Detroit by official representatives of the cities or districts in which they live, through the 53 newspapers cooperating in the promotion of the contests. Each of these papers is to hold preliminary contests to select its own champion. Any model builder in the United States may enter the national tournament, however. The cost will be approximately \$40 for the two-day meet—it covers hotel, meals and all such expenses—and transportation. Plans are being made to obtain reduced rates from the railroads, so that every person interested in the meet should apply for a certificate when buying his ticket to Detroit.

Contestants may obtain entry blanks from any of the newspapers conducting local contests, or from the Central Division, 700 American, Box 655 Lafayette Boulevard, Detroit. Entry tickets should be mailed to the manager of the Short Takeoff, 29 E. Cass, Detroit, who will be responsible for the contest. The contestants severely entered a model in a contest. Scale models may be shipped to the same address, express prepaid, if they are sent by June 31; thus it will be possible for builders to enter one of the three contests without being wholly on the ground. For flying contests, however, builders must handle their own machines.

### Pioneer Instrument Co., Brooklyn, Issues

#### Circulars Describing Two of Its Products

THE PIONEER Instrument Co. of Brooklyn has published two circulars, one describing its Speed and Drift Indicator and the other its Altimeter. The Speed and Drift Indicator, or Drift Angle Meter, is described in detail giving the principle of its operation and method of installation. In the other pamphlet Pioneer Altimeter is described and instructions given in its use. These pamphlets may be obtained from the Pioneer Instrument Co., 534 Lexington Ave., New York, N. Y.

### Frank Baker Company Becomes Buhl Plane Distributor With First Aircarrier Received

FOLLOWING ACQUISITION of the sales rights for Buhl Aircraft in California, Arizona, and Nevada by the Frank Baker Aircraft Co. of Culver City, Calif., a Buhl five place airplane was flown to Los Angeles from Marysville, Mich., by Dick Blair, chief pilot for Frank Baker.

Mr. Blair was accompanied throughout his entire flight by

his 16 yr. old daughter, Esther, a Los Angeles high school student. The trip was made in 36 flying hours. The new cabin airplane is to be used as a demonstration trip through the Western States, it is said. Frank Baker is also Vice-Distributor for Culver City.

### Irwin Aircraft Co. of Sacramento, Calif., Builds a Meteorplane for Texas Company

IRWIN AIRCRAFT Co., Sacramento, Calif., recently completed a new Meteorplane for the Texas Coast Coal & Oil Co., owner of Ando Irrigation oils. This little biplane weighs only 225 lb. empty and 575 lb. with full load. It is stated to have a top speed of 90 mph., a cruising speed of 75 mph., and a landing speed of 20 mph. The span of the

New Meteorplane built for Ando manufacturer lower wing is much greater than that of the upper wing, and the tail is offset to the lower wing side. The wings are definitely cantilevered. A 30 cu. in. four cylinder, two cycle engine is in the power plant. It is rated at 30 hp. at 1720 rpm.

As the fuel consumption is but 2½ gal. per hr. it is claimed that the plane has a range of 400 mi. The latest model Meteorplane has separate landing gear provided over all pylons, biplane wings for maximum in landing, fitting an under side of lower wing for tying plane down, baggage compartment, navigation lights, and a complete instrument board. The standard color scheme is red fuselage, yellow wings, and black trimmings.

### Bird Wing Commercial Airplane Co. Issues Pamphlet Describing Its Imperial Biplane

THE BIRD Wing Commercial Airplane Co., St. Joseph, Mo., has prepared a pamphlet describing the Bird Wing Commercial Imperial OX-6, open cockpit biplane. This plane is planned to sell for \$1750. A number of these have already been built and are being used for instruments by the Bird Wing School of Aviation. It is of conventional design with wooden wings and welded steel tube fuselage, fabric covered. The landing gear is of divided axle type and the tail surfaces are built entirely of steel tubing covered with fabric.

### Mid-Planes Sales & Transit Co., Minneapolis, Appointed "Command-Aire" Distributor

THE ARKANSAS AIRCRAFT Co. of Little Rock, Arkansas, has appointed the Mid-Planes Sales & Transit Co. of Minneapolis, Minn., (also distributor of the Fairchild Cabin monoplane) as the distributor of the Command-Aire in Minnesota, Wisconsin, northern Iowa, North and South Dakota, and Montana. In addition to being used as demonstrators, the Command-Aire will be placed in service for student instruction and other such activities.



**Novel Type Test Bed With Jupiter Engines In Tandem Is Developed by the Dornier Co.**

A NOVEL type of test bed has been developed by the Dornier Co. of Germany. As the engines on all the large Dornier flying boats are mounted in tandem in a nacelle above the upper wing, another nacelle has been built up and mounted on a hydroplane. The nacelle mounts two general Jupiter engines with their accessories mounted similar to



**Tandem Burner Super-Haf Jupiter engine installation and mounting on the new test bed.**

those on the new Dornier Super Wal. It is understood that the test bed has had over 200 hr. of running over the water at a speed of 75 mph.

**Forms the California Aerial Transport Co.**

**For General Flying and Instruction Work**

THE LASTEST addition to Los Angeles flying organizations is the California Aerial Transport Co., located about seven miles west of town on Foothill Boulevard.

Commercial flying and student instruction is now being carried out with an equipment of two OX-5 engined Travel Air planes. Soon after flying operations commence, a third plane will be needed and will be flown to Los Angeles by H. C. Lippatt of Clover Field, Southern California Travel Air distributor, who placed the planes in service at the Los Angeles field within 24 hr. and 56 min. after leaving the Wichita factory. A Whirlwind engined plane is to be acquired soon for advanced instruction.

Partners in the company are G. V. Dudley, Lawrence B. Talbot, and W. J. O'Conor. Pilots are P. H. Peters, Harry Gray, Carley, and Louis Paul Hansen. Lieutenant Hansen is used to hold the test span record by having made 55 consecutive turns from an altitude of 14,250 ft. in 2 min. 59 sec.

Private hangar space accommodates five planes, a shop, and complete equipment for ground course.

**Department of Commerce Now Lists Total Of 1,075 Airports and 4,000 Landing Fields**

THE DEPARTMENT of Commerce has now listed 1,075 airports in the United States, with 4,000 other fields on which planes can land. Some of these ports offer only landing facilities with grades and other supplies near at hand, but 211 ports are now equipped with the latest aerial navigational aids for both day and night flying. Intermediate landing fields, along regular well-constructed roads and backroads, the Department of Commerce now numbers 163. There are 17 airports in operation, also 78 fully equipped commercial airfields. California, with 133 commercial and other air ports leads all the states in providing accommodations for flyers. Pennsylvania, third in rank, with 68 fields, has 24 airports fully equipped by the Department—more, in the report, than any other state. In addition, Pennsylvania has two ports equipped for night flying. Illinois, with 58 me-

ports, of which 23 offer facilities for night landing, and Iowa and Oklahoma, each with 43 fields, follow next in order. Wyoming has the highest proportion of moderately equipped fields, 37 out of 41 in that state, offering off-night service.

**Harry T. Booth Establishes Consulting Office at Roosevelt Field, Long Island**

HARRY T. BOOTH, one of the best known air racing engineers, has announced the opening of a consulting office at Roosevelt Field, Newbury, Long Island. Mr. Booth is a old Curtiss designer, having joined that company in 1911. In 1921 he was in charge of the design of the Curtiss racing seaplane which Bert Acosta won the second Pulitzer Race with, then record speed of 176.7 m.p.h. at Omaha.

In the fall of 1922, Booth and his partner, Thornton, joined forces under the name of the Bee Line Air Corp. of Hamtramck, Mich., where they had the fifth fastest record for the Navy. The following year Booth and Thornton were in charge of the design and construction of the Wright 7X monoplane used by the Navy in the 1923 Pulitzer race at St. Louis. The team received third and fourth in the race with speeds of 220 and 210 m.p.h.

Following the 1923 Pulitzer Race Booth and Thornton joined Curtis Kirkham, where they designed and built the Voisin Flying boat and shared 1927 A. J. F.A.T. Williams race trophies.

**Wayne Air Service, Inc., of Detroit, Mich.  
Named Distributor of Bellanca Monoplanes**

THE WAYCO Air Service, Inc., of Detroit, has been named distributor for Bellanca monoplanes in Michigan, Indiana, Northern Ohio, Edward F. Sibley president of the company, announced recently.

William F. Brink, coupled with Sibley on the flight of his life at the 1929 Pulitzer, has been appointed general manager of distribution, Sibley said, and will shortly pilot the initial Bellanca monoplane here from the West after which distribution will begin.

**Like a Model**



**As well equipped and fast as in the Woodhaven Islands at Rochester, Michigan, that it presents the appearance of a model, as the photo shows, when it is viewed from the airfield, offers buildings, aerial wharf, and several new planes make this airway one of the most up-to-date in Europe.**

# THIS IS THE DAY OF METAL

ALL the experience of the past points to the necessity of metal construction in vehicles for transportation. They must encounter strains and stress under extremes of weather and use, yet perform their work safely and economically.

That is why the modern vessel is built of metal. The railroad car. The street car. The automobile body.

Each of these has a structure of metal and a covering of metal. Because economy and safety from structural weakness and the fire menace demand it.

The type of work the airplane does, and the conditions under which it operates, make the use of metal at least as necessary as in other vehicles.

It is gratifying to us to see the use of all-metal construction growing in this country. Not merely because it confirms our judgment in selecting metal over any other available material. But also because we believe it will further the cause of aviation by increasing the likelihood of safe operation and by permitting economies which will add to the prosperity of operators.

THE STOUT METAL AIRPLANE CO., Division of FORD MOTOR COMPANY, Dearborn, Mich.



PROBLEMATICS IN  
MANAGEMENT

CHINESE MIGRATION AND THE CHINESE COMMUNITY IN SINGAPORE

卷之三

The following table summarizes

Volume 20 Number 1

卷之三

# **PRUDDEN**



**ALL-METAL TRI-MOTOR**



# ECONOMY IN AIR TRANSPORTATION

show the Prudden Tri-Motor All-Metal plane  
passenger mile down to a minimum.  
Metal construction.

Comparisons show the Prudential Tri-Motor All-Metal plane operates as economically per passenger mile flown as any other air transport. □ Albatross construction, operation, upkeep and repair costs are three times lower.

Comparisons...  
operates as economically per hour  
single engined air transport. ■ Allowing  
practically eliminates depreciation, upkeep and repair  
And there is also the insurance provided by three engine  
power. Write for Comparative Cost Estimate on your per  
line. ■ We have an attractive Distributor prop  
... Dual Control... \$25,000 Flyer  
**AN DIEG**

**PRUDDEN-SAIL**  
**AIRPLANE COMPANY**  
**SAN DIEGO, CALIF.**

THANK YOU for monitoring ATTACHMENT



**Lieutenant Paris Preparing Twin-Engined Flying Boat for a Flight Across the Atlantic**

A TRANS-ATLANTIC expedition using a CAMEL 2A, twinengined, flying boat had its preparation in Marquette, France, and expects to take off for the United States very shortly. The plane is to be used in a long range military reconnaissance and bombing type converted for a long overseas flight. The crew is composed of Lieutenant Paris of the French Navy, who is in command of the plane, Chief Petty Officer Mireau, who will act as second pilot, and Petty Officer Cudot, who will act as radio man.

It is understood that two similar planes are being prepared so that in case of any trouble the second plane will be ready. According to recent reports the two air routes of



Twin-engined CAMEL 2A flying boat in which Lieutenant Paris and his crew plan to cross the Atlantic from France.

2000-300 hp. Jupiter engines have been replaced by two water cooled 600 hp Hispano-Suiza engines. The engines are arranged in tandem above the hull and behind the wings. The lower engine is mounted in front of the center section, and driving two ad tandem free propellers, and the upper engine is mounted in the nose of the flight deck and rear portion of the center section, driving the same power plant in reversible as a unit. The central portion consists of a system of longitudinal and cross members supported between the wings to the wing spars and to the fuselage bulkheads. In this central position the main tube engine mounts are arranged.

Through no detailed information is available at this time, it is assumed that it is similar in construction to the military model. The hull is of two step design but, unlike the other planes, it has a closed cabin for the pilots. The hull has a reverse V bottom with flat sides and rounded deck. Behind the steps the hull section gradually becomes elliptical. It is built up of a number of transverse frames of oak with poplar longitudinal. Two layers of teak and one of pine wood are used for the bottom covering while the sides, up to the water line, are covered with one layer of teak and one of plywood. Above the water line each plywood is used, except for the front deck and rear portion of the hull, which contains the fin, of moulded balsa wood. The wing skin is built in three panels, the center section and the two outer panels. The lower wing consists of two panels, each mounted to the main studs and built integral with the sides of the hull. By the use of two stay struts the wings may be folded in approximately 30 sec. The tail surfaces are well braced, the fin is of wood construction built integral with the hull. The stabilizer is of wood construction covered with plywood

whilst the elevator and rudder are of steel tube construction covered with fabric.

The general specifications of the military type are as follows:

Length	37 ft. 10 in.	45 ft.
Width overall	10 ft. 10 in.	10 ft. 7 in.
Height	10 ft. 10 in.	10 ft. 10 in.
Area	1000 sq. ft.	1270 sq. ft.
Weight empty	4000 lb.	5100 lb.
Normal disposable load	1000 lb.	1500 lb.
Normal gross load	5000 lb.	6100 lb.
Rated power	1200 h.p.	1800 h.p.
True landing	11.6 ft. per sec.	14.4 ft. per sec.
High speed, normal load	14 m.p.h.	14 m.p.h.
High speed, trans-Atlantic load	15.9 m.p.h.	15.9 m.p.h.
Cruising speed	100 m.p.h.	100 m.p.h.
Landing speed	10.1 m.p.h.	10.1 m.p.h.
Normal range	625 mi.	1100 mi.
Circling	11.9 mi.	11.9 mi.

**Black and Bigelow, Inc., New York Offer Aero Engineering and Business Services**

**ARNSHOLD BLACK** and **ANNE A. BIGELOW**, who for some time have been at work forming a new organization to render engineering and business services to aircraft operators and manufacturers, now announce the formation of the office of Black and Bigelow, Inc., at 301 Fifth Av., New York City.

Arnsbold Black is president and general manager of the new firm. Anne A. Bigelow is vice-president. George M. Fletcher Jr., (Patterson & Company) treasurer and J. Martin O'Connell (Smith, Kline & French) is secretary. In addition to these posts, the board also includes Benjamin P. Castle, Vice-president; E. F. Gandy, General Manager of the Aviation Division; Charles H. Colson, (president Passaic Investment Co.), Sherman M. Fairchild, (president Fairchild Aviation Corp.); C. T. Ludington, (president Ludington, Philadelphia Flying Service and second vice-president National Air Transport Inc.); William A. Rockefeller (director, Colonial Air Transport Corp., etc.); and Leonard Sparrow (president Federal Aircraft Corp. of America). Those associated with the new posts include Prof. Alexander Klemin (Aeronautics and Aeroplane Design), Raymond A. Leppons, vice-president Hazard Advertising Corp., J. E. O'Donnell (Aeronautics) and Philip E. Clegg (Accounting).

Not only engineering, but also traffic development, operation of flying operations, accounting and advertising will be among the services offered by the new company. The organization includes a group of specialists, each with an established reputation in his particular activity.



Arnsbold Black, president of new engineering and business service organization.



*for  
every Commercial Purpose—  
over Land and Sea*

The Loening Cabin Amphibian is the great flying automobile of all time. Its unique construction can easily be appreciated in this sketch which shows both land and water operation. For every commercial purpose, whether you are interested in the Loening Cabin Amphibian, or in one model suitable the your particular needs, we invite you to call for an extensive illustrated booklet containing descriptive information and to speak to your agent or dealer.



Patent and Trademark Office of the U.S.A.—U.S.P.T.O.—Reg.

Pioneers in aircraft development, Loening Aeronautical engineers have concentrated for more than a decade on a single purpose. Today, because of this highly skilled specialization, the Loening Cabin Amphibian embodies proven principles that place it far in the vanguard of commercial plane development. Proven under all conditions by more than a hundred ships which have flown more than two and one-half million miles in Government service, the Loening Amphibian is now available for commercial use in cabin form. Its extreme versatility, due to its equal operating efficiency from both land and water, more than doubles the scope of usefulness and greatly reduces the restrictions which govern the usual airplane operation. Delivered for flight, New York, fully equipped and perfectly appointed, \$26,700

**LOENING AERONAUTICAL  
ENGINEERING CORPORATION**

Thirty-first Street and East River  
New York City

**Alexander Company Orders 1,000 Floco Engines from Frank L. Odenbreit, Inc.**

AN ORDER for 1,000 airplane engines, involving total expenditures of \$4,000,000 has just been received from the Alexander Engineers Co. of Colorado Springs, according to Frank L. Odenbreit, Floco engine manufacturer, Los Angeles, Calif.

This is said to be the largest single business transaction involving the sale of airplane equipment, in the history of commercial aviation. The contract specifies calls for a maximum delivery of 60 engines per month, the first shipment to be accomplished by the beginning of June.

Prior to obtaining this order, Thomas M. Hardisty, director of sales, T. C. Alexander, chief test pilot, and W. M.



Frank L. Odenbreit, Floco company president, stands beside the six-cylinder prime in which are seated Thomas Hardisty, sales director, (left) and W. M. Alexander, chief test pilot.

Patch, special Floco representatives, made a dual flight from Los Angeles to Colorado Springs in the Floco demonstration plane, "Spartan," during the early part of May, carrying a load of block and liquid fuel for J. Dan Alexander, and engineer of the Easterner company. The round trip flight was made with a total flying time of 20 hr and 50 min over a 2,000-mile route and through varied adverse weather conditions.

The Floco corporation has installed more than \$100,000 worth of standard equipment, giving the plant a production of 100 engines per month by July 1, Mr. Odenbreit said, in order that prompt delivery of these engines may be made to other aircraft manufacturers.

**Captain Carranza Flies Non-Stop in Ryan Airplane from San Diego to Mexico City**

IN A non-stop flight of 1,088 mi., Capt. Eddie Carranza flew from Camp Kearny, San Diego, Calif., to Valencia Airfield, Mexico City, May 24-25. The 20 yr old Mexican pilot is being hailed by his countrymen as a national hero following his spectacular 18 hr. 20 min. flight. He made a Ryan plane similar to the Spirit of St. Louis except for a slightly smaller gasoline capacity.

Captain Carranza flew low in the plane, the "Mexico Excellent," along the Gulf of California, passing over Guaymas. From Mexicali he flew to Guadalajara and from the latter point to Mexico City. He carried a total of 365 gal. of fuel in the flight, with 146 gal. in the wing tanks and 123 gal. in the fuselage cisterns.

Captain Carranza now plans to fly from Mexico City to

Washington, D. C., at a Mexico good will flight receiving the courtesy of Colonel Lindbergh's Washington-Mexico (by non-stop journey of last December).

**DH Moths and DH Engines to be Produced in America by New Delaware Corporation**

**QUANTITY PRODUCTION** in the United States of the de Havilland Moth has been announced by the Moth Aircraft Corp., which has been incorporated in Delaware with a capital of \$500,000. Rights to manufacture not only the de Havilland Moth but also the four-cylinder de Havilland DH engines have been obtained by the company. The engine develops 130 hp.

The first American built Moth is to be completed early in August, according to plans. A number of engines will be imported from England in order to hasten production. The DH Moth import is holder of a number of records for both distance and speed.

Earl L. House is business manager of the new concern, J. Edwin Monroe is factory manager in charge of production, while Kenneth H. Dugay is in charge of sales. Horace H. Woods, 500 Federal Ave., New York, is chairman of the board of directors of the company. Joseph Smith of New York City will serve on the board. House, Monroe, and Dugay will also act as directors.

**Morrow a Pioneer**

During the World War, Morrow was vice president of the Willys-Overland Co., which, it is said, built more than 7,000 QX-5 fighters for the Government. He was also one of the pioneers who, with Glenn H. Curtiss, Alexander Graham Bell, and Lawrence Brereton, made sensational experiments at Hammondsport, N. Y. Morrow was assistant factory manager of the Atlantic Aircraft Corp. of Hackensack Heights, N. J. Dugay is a veteran pilot and Royal Air Force First Class. Both also saw active service during the war.

**Dirigible Italia Bearing General Nobile and Crew Reported Lost After Flight to Pole**

AS WE go to press, General Nobile and his crew are reported lost in the Arctic wastes following a flight over the North Pole. The dirigible Italia, scheduled to return to Italy at Spitzbergen after a week-long stay, had only partial radio equipment signifying distress have been received from the Italian expedition. Latest reports indicate that the airship has drifted toward Siberia.

General Nobile made his trip to the Pole on May 23 following a flight to Lecco, Italy. Messages from the RAI stated that the ship stopped and circled the North Pole for two hours and then the next midnight headed south for the return flight. Reports on May 24 of steady flight south, however, were shortly followed by silence. Various plans of a rescue attempt are now being considered, the latest report of Dr. Milone already having started north. It is estimated that the Italia is capable of remaining silent for a period of two weeks.

**Sixteen Were in Nonstop Flight**

Capt. George Amdam, who was accompanied by General Nobile in the flight of the dirigible Norge over the North Pole in 1926, and Capt. George E. Williams and Capt. Col. P. E. Lind, who recently flew in their Lockheed Vega plane from Fairbanks, Alaska, to Spitzbergen, are among the pioneering aviators attempting these 18 non-stop flights. The others, 11 in number, most of whom were in the Norge flight,

# MAHONEY



Col. Harry and Col. G. A. Lindbergh smiling by

*on Land*



*or Water*

**THIS BROUGHAM** is designed to dominate the Whirlwind cabin monoplane field. As a fast plane, equipped with Eds. Poconoos, take-off with five people and 67 gallons of gasoline has been made in 18 seconds. As a land plane, with five people and 63 gallons of gasoline, it

**DEALER DISTRIBUTOR**

**MAHONEY AIRWAYS CORP.**  
CAPITAL AIRWAYS INC.  
MAHONY AIRCRAFT CORP.  
MAHONEY AIRCRAFT CORPORATION  
MAHONY AND STEVENS INC.  
MAHONEY AIRWAYS INC.  
MAHONEY AIRCRAFT CO.

President & Mgr. Max Washington, D. C.  
Baltimore, Md.  
Milwaukee, Wis.  
Youngstown, Ohio  
Milwaukee, Wis.  
Milwaukee, Wis.  
Milwaukee, Wis.  
Milwaukee, Wis.  
Milwaukee, Wis.

Midwest Airways Corp.  
Terre Haute, Indiana  
Milwaukee, Wisconsin  
Milwaukee, Wisconsin  
Milwaukee, Wisconsin  
Milwaukee, Wisconsin  
Milwaukee, Wisconsin  
Milwaukee, Wisconsin  
Milwaukee, Wisconsin

Binghamton, N.Y.  
Pittsburgh, Pa.  
St. Louis, Mo.  
Baltimore, Md.  
Long Beach, Calif.  
Los Angeles, Calif.  
Gainesville, Fla.  
Cleveland, Ohio  
Cincinnati, Ohio

The valuable Mahoney franchise is available only to operators and qualified business executives.

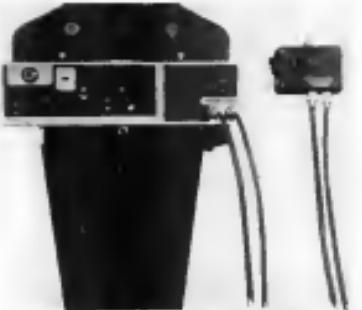
"U. S. Dept. of Commerce Approved Type Certificate No. 23"

**THE MAHONEY AIRCRAFT CORP'**  
Owners of Ryan Air Lines  
San Diego, Calif.  
St. Louis, Mo.  
Ryan Flying Company  
TELETYPE 702 for nonstop ATLASTON

**Special Aerial Camera for High Altitude****Work is Built by the Fairchild Company**

THE WORLD'S largest aerial camera, specially designed and built for operation at high altitudes has just been completed at New York City by the Fairchild Aerial Camera Company in cooperation with the Aerial Photographic Department of the Army, Air Corps of Wright Field, Dayton, O. It will soon undergo its first trial test at a Long Island field.

According to Sherman Fairchild, president of the Fairchild company, the new camera has been designed to operate 30,000 ft. or more. It is said that the new automati-

*The new Fairchild camera used at altitude.*

cal camera can operate at altitudes greater than any prior day plane can attain. The idea is to make full merit the end of two years' experimental and development work applied to the project.

The designing and building of this new aerial camera was undertaken by the Fairchild Aerial Camera Corp. at the request of the U. S. Air Service; an extensive camera was required which would operate at altitudes beyond the reach of anti-aircraft guns.

This new automatic camera is the only one of its kind in existence, and is said to be not only the largest, but one of the most efficient. Its actual size is 48" x 58" x 28".

Many unique features have been incorporated in the camera structure and design, among the more important being the following:

- 1 An electrical heating system for preventing the shorter from freezing at temperatures as low as 50 deg below zero (Fahrenheit).

- 2 Complete automatic control and operation, with a 30" focal length lens, having an F 4.5 aperture.

- 3 Incorporation of a device which records on each picture the time of day at which it was taken, hours, minutes, and seconds, the altitude, the degree of tilt of each exposure, the number of the exposures, and any other pertinent data which the observer might wish. All this information is recorded in a sheet smaller in size than an ordinary writing card.

- 4 An automatic timing device is also part of the equipment whereby the exposures are automatically controlled at

whatever specified interval is desired by the photoguide. 5 Special filters are provided for protection of the camera lenses.

The new serial camera will make an exposure 30° x 20° in size, the largest ever developed. Heretofore the size of exposures made by the largest aerial cameras has only been 17° x 17°. As to the range and adaptability, Fairchild estimated that a plane equipped with this new camera and flying, for example, at a height of 20,000 ft., will be enabled to photograph a single exposure as large over four square miles as can exist in a single detail. The exposure of that camera will carry enough detail for 1000 exposures of 1000 feet without overlapping.

Upon completion of the tests at New York, the camera will be sent to Dayton, O., where it will be installed in an Army plane for extensive experimental photographic work.

**St. Tammany Company is Lowest Bidder****For New Orleans-Border Mail Transport**

**THE ST. TAMMANY GULF COAST AIRWAYS, INC., of New Orleans, La., was the lowest bidder on the proposed air mail route from New Orleans, via Houston, Tex., to San Antonio, Brownsville, or Laredo on the Mexican border, both due stage ways recently opened at the Post Office Department. The firm agrees to carry the mail over this route for \$1 per lb.**

**Other bidders on this route were: Western Air Express, Los Angeles, \$1.05 per lb.; Trans-Aero Corp., Tampa, Fla., \$2.25 per lb.; Maywood Wings, Houston, Tex., \$3.00 per lb.; Western T. Varney, Wilkes-Barre, Pa., \$3.25 per lb.; and Pan American Airlines, Pittsburgh, \$2.00.**

Bids were also opened on the three foreign routes now proposed, the contracts on which expire July 1, 1933. The following bids were received on the route from Seattle, Wash., to Vancouver, B. C.: Boeing Air Transport, Seattle, \$104.25 per round trip; Northwest Air Service, Inc., \$104.50 per round trip; P. F. Barnes, and Leslie C. Gould, Seattle, \$14,250 per round trip.

**Bay West to Mexico:** H. K. White, Philadelphia, Pa., \$1.00 per lb.; Pan-American Airways, Inc., New York City, \$1.00 per lb.

**New Orleans to Florida:** Arthur E. Carlson, New Orleans, \$5.00 per round trip; Memphis Airways, Inc., New Orleans, \$6.00 per round trip.

**Two World Seaplane Load Carrying Marks****Are Shared by Navy Pilots Flying PN-12**

**29,000 MILE** world seaplane records have been broken with the Navy PN-12 plane in which Lieutenant George and George recently set a new mark of 36 hr. 1 min. 24 sec. in flight duration. Lieutenant George with Lieutenant Leslie J. May as co-pilot and George Pease, mechanic, formed the crew of the plane in which they record flight.

With a load of 2,000 lb. dead weight, the plane took off from the Bay of Fundy and completed a nonstop flight to Philadelphia in the air 12 hr. 55 min. 31 sec., May 25 at Philadelphia. The former mark was set 21 hr. 7 min. 26 sec. and was set by the PN-10 = 1937 by Lieutenant B. J. Conner and the Navy.

The second mark to be surpassed was for distance record with wartime load. The PN-12, in flight, traveled 8,210.79 mi., it was estimated, thus breaking the record of 8,044 mi. set by Richard Wagner and George Zimmerman in a Douglas plane on Aug. 8, 1937 at Altenrhein, Switzerland.

Both marks might have been set, if it is said, had it not been for the fog, winds, and rains which were encountered. Making the conditions, the PN-12 was brought down, though 300 gal. of fuel were still left in her tanks—enough to have covered an additional 500 mi.

**A BOOKLET -- free!**

Fascinating and  
Instructive

*A Real Eye-opener!*

To

**EXECUTIVES OF THE AIRCRAFT INDUSTRY**

**H**ERE'S a compact little booklet containing important charts, statistics, data and information every present and prospective manufacturer of airplanes, motors and accessories should possess. This booklet shows . . . how large investments in expensive plant locations and buildings can be eliminated . . . how aircraft production costs can be reduced . . . how plant and labor efficiency can be improved . . . how peak production schedules, tests and all other activities can be conducted throughout the entire year without interruption from snow, sleet, atrocious fog, rain, freezing temperature, extreme heat or elec-

trical storms . . . what the U. S. Govt. found in a nation-wide investigation covering sites for an aviation training school . . . Etc. etc.

Included in this booklet is a brief description of Lindbergh Field—San Diego's \$650,000,000 new municipal airport, now under construction. When completed, this Triple A airport will be one of the finest in the world, and space on this field is being provided for airplane factories at unusually attractive rates. *Inquiries Sought.* For the booklet and other information write to the Industrial Development

Department, T-96  
Chamber of Commerce  
Blk. 1, San Diego, Calif.

**San Diego**  
**California**  
**Air Capital of the West**

**A VACATION SUGGESTION**

**San Diego** is acknowledged as a premier and unique playground of the West and offers many opportunities for vacation pleasure and the same fine form of sport and outdoor sports ship to the visitors as one finds in Europe.

**Don't Forget**  
**AUGUST 16 - 17**  
**Induction of Lindbergh Field**—the greatest aerial exhibition in the history of aviation. The 1932 Pan American Games will be held in San Diego during the same time. Come along and see the wonderful possibilities for aircraft education in San Diego.

## Last Minute Briefs

The new Curtis-Eaton plane has been awarded approved type certificate No. 46, according to an announcement from C. L. Gitterman of the Department of Commerce.

A 40 acre flying field is being established at Knockdown Hill, by the Wilson-Kennedy Aviation Co. of Hampton, Va. The field is square and free of obstructions.

Letters inviting delegates to the Detroit Air-Olympics have been mailed by the Detroit Board of Commerce to 3,000 heads of commerce throughout the country.

John J. Knuehl, veteran of 37 yr. post office service, has been appointed assistant superintendent in charge of air mail in the Chicago office.

The Twin Falls Aircraft Co. of Twin Falls, Idaho, composed of E. J. Beyea, E. E. Instrator, and L. H. Walden, has become Englewood plane distributor in Southern Idaho.

B. Russell Shew Co., Inc., St. Louis airport engineering company, has been named to provide an up-to-date airport at Tammerville, Okla.

Promulgated General New regulations that, effective July 18, the overnight New York-Chicago mail service will be extended to include Cedar Rapids, Ia., Des Moines, Ia., Omaha, Neb., and Lincoln, Neb.

Mrs. Bloughammer and Marcus Dickey have formed the Springfield Aerial Service Co. at Springfield, Mo. They are negotiating for an 80 acre flying field and have already ordered a six place motor hangar.

Read to be the first woman in America to own and operate an aircraft company, Mrs. C. E. Strohs manages the Rocke Airlines, Inc., Omaha, Neb., Eastern Nebraska and Western Kansas Englewood distributor.

The western trans-Atlantic stars, Captain Koehl, Barnes von Hessen, and Major Fliegermeier, have reported to New York city, their tour completed. It is reported that they will stay for June 2.

A new plant is being opened near Glendale, W. Va., by the Poholer Aircraft Corp. About 380,000 sq. ft. of floor space is available at the new factory, which has been leased to fill an overflow of plane orders.

Maj. G. A. Lewis, who recently was the German Marine Trophy Race, has received Navy Department orders to fly a Poholer transport plane to the Marine Corps base on Key West. The date of the flight is as yet undetermined.

Colonel Lindbergh left Curtiss Field, L. I., May 29 on the first leg of a trip to the West Coast for the purpose of surveying the new Transcontinental Air Transport air roads. Major Lanphier accompanied him.

A new plane and engine have been constructed by the Minneapolis Aeroplane Corp., Minneapolis, W. Va. Charles Fong, designer and builder, reports satisfactory results in preliminary tests.

Lt. Frank Seidell, Marine Corps Corp, has come to Washington to review the Congressional Model of Helio's helicopter for use for bringing supplies to isolated troops and for carrying out wounded under fire in Norwegian engagements.

Aeromarine survey markers, described in our last issue, are to be erected immediately at 28 North Carolina sites of interest, it is reported. Some 60 of the new survey grade posts will be utilized.

Colonial Western Airways, Inc., operator of the new Atlanta-Gainesville air mail line, has established offices in the Tex Ryke Hotel, Atlanta. H. F. Wood has been appointed as Capitol District Manager.

Induction of the new Schenectady, N. Y., airport took place June 1, 2, and 3. A pageant, which included exhibits for service and civilian lines as well as exhibition flying, was a feature.

A House committee has imposed censorship on a bill to award gold medals to George D. Chinnock and Charles A. Lovett, who flew from New York to Germany last year in the Bellanca Cobweb.

Yung Miller of Cleveland, O., has been appointed Ohio dealer for the Berliner monoplane monoplane, manufactured by the Berliner Aircraft Co., Inc., of Alexandria, W. Va. The first plane has been sold to Desotoe Madsack, Cleveland banker.

The recently formed Lake Village Airways Corp. of Lake Village, Ark., announces the appointment of Lt. Col. James C. Youngblood, 188th Observation Squadron, A.M.C., as pilot and controller. An American Eagle plane is owned by the company.

Appointment of Charles E. Tolier as manager of the general department of the General Motors Co., Schenectady, N. Y., is announced by A. G. Davis, vice-president Tolier, who has been assistant manager since December, succeeds A. D. Laut, deceased.

Coffeyville, Kan., city commissioners have signed a five year lease on a 147 acre tract of land to be used as a municipal airport. Thomas L. Hall, Swallow plane agent, will move his planes from the South Coffeyville Airport to the new field, which is to be fully equipped, it is said, by July 1.

Lt. Col. Calh V. Hayes, regular Army instructor with the 18th Army Observation Squad, Washington National Guard, has been named to succeed the late Maj. John P. Fischer as commander of the unit, states a spokesman. Lieutenant Hayes has been in the flying corps for more than 18 yr.

Then Hanau, German airmen now in this country, to have delivered a new Italian monoplane similar to the Colombo. The plane is equipped for long distance flight with four of 500 gal fuel capacity. When Hanau, it developed, it had purchased the Italian Destroyer "Adelaide," as previously reported.

A new American seaplane altitude record was established on May 28 when Lt. Ken French piloted the Navy PN-2 to a height approximating 16,800 ft. The exact altitude will be determined when the barograph records are calculated. The former American record was 13,075 ft., while the world record is 20,186 ft.

# Cessna Laps the Field at the Kansas City Races

The only real and real interesting event was the stellar performance of the new Cessna monoplane. Piloted by France "Ginger" Bowles, the Cessna glided right into its wake. He had gained a full lap on his nearest competitor at the end. Through the "mean" starting with a torch, he leaped into the air, flying close to the ground and rounding the pylons to a standstill bank. Flying the course four times, he sat at the checkered flag, shooting up for a share of a 1,000 feet straight up for a share of a 1,000 feet. William F. MacCracken, government aviation chief, was one of the first to congratulate the winner, and commented "Ginger" on his masterful handling of the cantilever plane.

The Cessna's official time on the 6-mile triangular course in the 30 mile race at Kansas City was 137.2 miles per hour, taken from a starting start.

Where does the Cessna Can-  
nibal Cabin Monoplane get its  
surprising speed? Whereon does  
it differ from all other cabin  
planes planes?

The Cessna embodies entirely  
new principles of structural  
design which reduce wind re-  
sistance to the absolute minimum.  
Body strength of Chromest  
Molybdenum Steel, it also af-  
fords the greatest possible safety  
to pilot and passengers.

Equipped with the Wright  
Whirlwind motor, at 900, or  
the 10 cylinder Continental Au-  
tomatic at 4350 (both prove in-  
cluding landing broken and air  
speed) the Cessna is truly the  
outstanding "boy" in the field  
today.

Write or wire us for descriptive  
literature and specifications.

**Cessna Aircraft Company**  
Wichita, Kansas





## For The Discriminating Purchaser:

### THE AIRSEDAN

**AIRLINE OPERATORS** will find this plane meets with all their requirements. The cabin has exceptionally comfortable seats for four large passengers and the pilot's visibility is unexcelled.

**PRIVATE OWNERS** will approve of the fine appointments which are selected to satisfy the most critical taste.

**CORPORATIONS** desiring to keep step with the progress of the times will find that here is an efficient and up-to-date vehicle for transporting executives and personnel to widely separated branches.

We will be glad to assist you in determining the adaptability of this fine product to your requirements.

**BUEHL AIRCRAFT COMPANY**  
Marysville Michigan

### Lieutenant Champion Preparing His Wright "Apache" for New Altitude Record Attempt

LIEUT. C. C. CHAMPION, Jr., U.S.A., holder of the world's altitude record, is busy with preparation for another altitude flight in his Wright-engined Wright "Apache", as Airman goes to press.

Associated with the present record which is 35,426 ft., and believing that he can surpass this height by from 8 to 12 thousand feet, Lieutenant Champion is enroute with his post-graduate sponsor at Worcester, Mass., in order to have his "Apache" checked in at the altitude test.

The little "Apache", which last year reached what Lieut. Champion then and still believes to have been an indicated altitude of 45,000 ft., has been thoroughly reconditioned after its spectacular descent during which it might fly four different times. A new Pratt & Whitney Whiz has been installed, the wings of the plane have been re-covered, the supercharger has been thoroughly tested and permanent recording high altitude instruments have been added.

The little plane is at the Naval Air Station, Anacostia, the scene of its former high altitude attempts both as a land plane and seaplane. At the time of the spectacular flight last July, the indicated altitude figure was 45,000 ft. and the altitude noted in view of the fact that Jean Gallieni reached the books as the record holder with a mark of better than 46,000 ft. Subsequently this was watched by the record-setters.

Champion, with his "American record", automatically stepped into the class of "champion of the world". Several months ago an aspiring Italian pilot adopted the 35,426 mark to a number of feet, but not as much as 199 meters which the regulations require. ladies a new record will be granted. Knowing the capabilities of the Wright engine and the little single motor Apache as well as he can safely to withstand high altitude work, Lieutenant Champion is quite anxious for a new attempt.

Numerous unexpected delays may be encountered resulting in prolonging the tests and then again the flight may be canceled immediately, it is said.

### Cuffman-Strong Aircraft Co., Clinton, Okla., Constructs First Experimental Monoplane

COFFMAN-STRONG AIRCRAFT CO., Clinton, Okla., completed its first experimental model plane recently. It is a three place monoplane designed to carry one power plant up to 150 hp. though the first model was built with a 90 hp. Curtiss OX-5. This plane was used in the Oklahoma State Air Meet and it received the highest marks of interest at every airport visited. One of the novel features in its design is that the main stock is suspended from the wing giving direct control to the ailerons mounted on the high wing. The plane has a span of 27 ft. and chord of 6 ft. 8 in., giving an area of 247 sq. ft. The airfoil used is a modified Clark Y. The length is 22 ft. 8 in. and height 7 ft. 5 in. It weighs 1,940 lbs. empty and has a gross weight of 3,720 lbs. According to figures supplied, the high speed is 130 m.p.h. and landing speed 30 m.p.h.

H. Coffman, president of the company, is the designer of the plane. For a number of years he has been doing aerial flying and commercial work. He has been working on this design for some time and as soon as factories are built in Clinton it is planned that a production of one plane a day will be maintained. The company is incorporated with \$200,000 capital stock. H. R. Gilchrist is vice-president and Donie E. Ferry is secretary and treasurer.

### Fleet of Airplanes Will Leave Des Moines June 18 for State of Iowa Good Will Tour

MORE THAN 20 airplanes are expected to participate in the Iowa Good Will Tour which is to leave via Des Moines Municipal Airport June 18 to visit 10 of the larger towns in the state. A total purse of \$3,000 has been posted for the winner of the five day journey. Standard and third prizes are \$1,000 and \$1,000, respectively.

Over 1,000 persons, operating from airports within the state, have been invited to join with their demonstration planes. The race is to be conducted along the same lines as the Paul B. Holmberg Tours. It is being planned under the auspices of the Iowa chapter of the National Association of Automobile, George Taylor, the flying photographer, and Jack Walker, former Army Ace, are in charge of all plans for the tour. No entry fee is required. Entries should be mailed to Iowa Good Will Air Tour, 1004 Grand Avenue, Des Moines, Ia.

The tour will leave from Des Moines Municipal Airport Sunday morning, June 18. The proposed itinerary is as follows:

June 18—Leave Des Moines, Iowa City, overnight  
Leave Cedar Rapids, overnight Waterloo, June 19—Leave Sioux City, overnight Fort Dodge, June 21—Leave Woodward City, overnight Sioux City, June 23—Leave Council Bluffs, return to Des Moines.

An exhibition has been scheduled at the Standard Oil Co. in and the Field place to accompany the tour. The newspaper offices, Des Moines newspaper, will send its men, Farnell, managing editor "Good News", and Harry Holt, managing Des Moines newspaper man, will include his Ryan monoplane "Miss

Low" in the list of entries. The White Aircraft manufacturers of the "Whitney Sport", are planning to enter one or two of its new production planes, and the Chiricahua Aerogational Service has promised to enter an Arrow biplane, of which it is distributor.

### To Make Iowa Armed

The purpose of the tour is mainly to acquaint a greater number of Iowa people with the modern types of aircraft now available and to create a more informed atmosphere throughout the present Iowa public so that the state will share and readily respond to all aviation programs presented.

Nearly all of the towns to be visited have improved airports. Several prominent men will be taken along to address aviation dinners and banquets arranged in honor of the visiting airmen. The apparent tour benefits derived from a similar tour held in the state of Kansas has prompted the aviation enthusiasts of Iowa to promote this tour to its fullest extent.

### Lindbergh Beacon's 8,000,000 Candlepower Beam Now Flashing on Los Angeles Tower

PERHAPS the most significant feature of the dedication of the new Los Angeles City Hall recently was the flashing of the Lindbergh Beacon which has been placed at the top of the 452 ft. tower.

This light has a 800 watt filament lamp burning below a 48 in. mirror, the rays being concentrated by a 24 in. lens into an 8,000,000 candlepower beam that is visible for 60 mi. in fair weather. The light revolves six times a minute.

**BOYCE MOTOMETER**

**Model G**      **Model H**

*Dependable Motor Heat Indicators*

THE MOTOMETER COMPANY, INC. . . 1 WILMIS AV., LONG ISLAND CITY, NEW YORK



# IT'S NEW!

## The Sensation of ONLY Aircraft Books \$1.00

For the first time, in non technical, plain English here's a new book that gives you the whole theory and practice of Aviation. Its 132 pages and 49 illustrations take all the mystery out of this increasingly important subject.

**Plain English Chapters on**  
Theory of Flight, Mechanical Losses, Controllability  
Inherent Stability, Forces of Design, Construction,  
Practical Flying, Weather and Aviation A Lesson  
in Flying

### Notice to Flying Schools

Your students will save in overflight least time  
and will be better from it at the end of their training  
if they read this book before taking instruction.  
Prices to wholesale users on request.

#### USE THIS COUPON

ROTH-DOWNS AIRWAYS, Inc.  
216 University Ave.  
SAINT PAUL, MINN.  
Here's my dollar ready to postpaid a copy  
of "The Modern AIRPLANE"  
Name \_\_\_\_\_  
Address \_\_\_\_\_

ROTH-DOWNS AIRWAYS, Inc.  
Saint Paul, Minnesota

THANK YOU for advertising AVIATION

# REVIEWS

The 4th Engineering Aviation, 100 West 45th St., New York City, made up of books containing engine performance publications, 12.50. Order from Aeroplane Publishers, Inc.

Aircraft Handbook by Fred H. Collier and Henry F. Collier, McGraw-Hill Book Co., New York City. 30 pages \$1.00.

Third and revised edition of a handbook written at the time of World War requirements. It has been brought up to date and includes new chapters on Department of Commerce Air Regulations, NACA recommendations for servosystems, radio equipment, modern instruments, and expert aerodynamics. This edition has been so revised that it can almost be called a new book. The chapters on rigging and assembly of the Curtis JN-4 are still included as are those on propeller problems, airfoil theory, and the Curtiss OX-5 engine. Latent energy as well as the Hispano Suiza engine, the Wright Whirlwind Curtis 7-233, Parcher engines, and Pratt & Whitney Wasp engines are described in detail. The book is bound with a soft cover and is of convenient size.

Technical Publications Received  
N.A.C.A. Technical Note 283: Corrosion Resistance of Aluminum. I. Practical Aspects of the Problem by Harry S. Rawdon, Bureau of Standards.

N.A.C.A. Technical Note No. 285: Corrosion Embrittlement of Duralumin. II. Accelerated Corrosion Tests and the Behavior of High Strength Aluminum Alloys of Different Compositions by Harry S. Rawdon, Bureau of Standards.

N.A.C.A. Technical Note 284: Corrosion Embrittlement of Duralumin. III. Effect of the Previous Treatment of Base Material on the Susceptibility of This Type of Corrosion by Harry S. Rawdon, Bureau of Standards.

N.A.C.A. Technical Note 286: Corrosion Embrittlement of Duralumin. IV. The Use of Protective Coatings by Harry S. Rawdon, Bureau of Standards.

### Stock Corsairs Perform Well in the VO Class of the Curtiss Marine Trophy Race

HIGH SATISFACTION has been expressed with the performance of the Wright Corsair in the VO observation plane class in the recent Curtiss Marine Trophy Race held at Washington, D. C. The two general purpose two motors, both of which were built and tested, not ground for racing, showed speeds of about 180 m.p.h. slightly hanging in the air at 1000 ft. and making passes at 1000 ft. The leading Corsair showed higher speed over the entire course than the first six place finishers, which took the world speed record off the class C-2 seaplanes last year over a closed circuit.

### Fast Despite Bulk

Lieut. Condr. W. K. Harrel, U.S.N., turned in an average speed of 180.6 m.p.h. in placing his Wright observation fighter among the top. Unlike the single place aircraft, Harrel's craft carried bullet load as well as a good number of passengers. The Wasp engines in a 200-hp. Curtiss had less than three hours of flying before the return race. In fact, after the passengers had been put in, the check flight had been made to test the engine.

Kreider-Reisner Company's Added Facilities To Double Production of Challenger Planes  
THE KREIDER-REISNER Aircraft Co., Inc., has recently increased its plant facilities in Elizabeth, N.J., by acquiring several additional buildings. The addition of these new spaces gives them a total of 27,000 sq. ft. and will make it possible to increase the production of Challenger aircraft from three a week to eight a week. By the first of July they hope to be producing eight planes each week.

The original Challenger was built in a small frame building approximately 30 x 60 ft. and located in the northern part of Elizabeth. Later a one-story factory building 50 x 180 ft. was acquired. This building is located just across the railroad tracks from the original building and the two house all manufacturing operations until the first of May. These planes a week were produced in these quarters. In order to supply the demand for Challenger planes, it was necessary to increase production and thus required more floor space. A two-story building approximately 60 x 150 ft. was located within 100 ft. of the original manufacturing building, was obtained and the original building was moved to the rear of the new building, which also houses the office and shop rooms.

Wing construction and all painting and doping are still carried on in the original manufacturing building. Engine assembling and storage are taken care of in a two-story building which is approximately 40 x 80 ft. and located in an entirely different part of the town. The engineering office and production office are located in a small building near the manufacturing buildings.

Painted planes will be erected at the Kreider-Reisner Airport which is three and a half miles from the factory. As the factory is at the edge of the town, it will not be necessary to truck the fuselage and wings through any congested traffic districts.

### New Cincinnati, O., Chapter of National Aeronautic Association Appoints Officers

CINCINNATI CHAPTER, National Aeronautic Association at its first meeting, recently, elected the following officers: Harry D. Hopf, chairman; President, Edith A. Spier, vice chairman of the International Aircraft Corp.; Vice president, Clarence Teep, secretary, E. J. Wade, treasurer, and Stanley S. Laddie, Stanley C. Hoffmann, and Perry V. Ogden, trustees. Clarence D. Chamberlain, international born, recently brought the visit of his chapter to Cincinnati where he came to the city to dedicate the International company's field.

Chapter members in the organization, which is open to all persons interested in aviation, are Clarence Teep, Albert H. Johnson, Jr., A. J. Lester, P. J. Lomax, Knut de Masi, Arthur Strickland, Louis E. Connelly, Harry D. Hopf, Theodore R. Hunter, Ralph V. McCullagh, Frank G. Shawver, J. H. Butler, John Sheldren, James L. Knight, Stanley Hoffmann, Ed A. Spier, Perry V. Ogden, E. J. Wade, Stanley S. Laddie, Alvin W. Rock, W. F. LaSalle, Stanley Deacon, Walter A. Draper, O. V. Sawyer, and Earl Parker.

### Lieutenant Sweedley Makes Dawn-to-Dusk Buffalo-Galveston Flight in a Falcon Plane

LIEUT. WILLIAM R. Sweedley, Army pilot, recently completed a dawn-to-dusk flight from Buffalo, N. Y., to Fort Crockett, Galveston, Tex. The flight was made in approximately 13 hr. 25 min. in a new Curtiss Falcon A-E plane, stops for fuel being made at Louisville and Memphis. The distance is estimated at 1,050 mi.

# A Message to Aero Manufacturers, Operators and Pilots

THE existence of Aerol Shock Absorbing Struts effects your business whether you use them or not. Manufacturers offering them have an advantage over their competitors. Operators whose planes are equipped with them may have greater cost and greater passenger acceptance. Pilots who land on them have the safety and confidence of smoother, faster landings and comfortable坐着 regardless of the condition of the ground.

Aerol Shock Absorbing Struts absorb landing impact equal to several times the weight of the plane without recall.

They operate on the air and oil principle. Impact is absorbed by the compression stroke of the strut piston. The resulting compression is instantly dissipated through the oil chamber thus eliminating recoil.

Trouble-free, dependable and economical, Aerol Struts recommend themselves to the attention of everyone connected with the manufacturing and operation of heavier-than-air machines. They are a product of our 25 years' experience with compressed air applications.

Complete information supplied on request.

CLEVELAND PNEUMATIC TOOL CO.  
3737 E. 78th St., Cleveland, Ohio



"Ask the Pilots Who Land on Them!"

**AEROL-STRUT**

**A.S.M.E. Will Hold Special Aero Meeting  
In Conjunction With Detroit Air-Olympics**

A SPECIAL national meeting of the aeronautics division, American Society of Mechanical Engineers, will be held in Detroit June 29, 30, and 31 in conjunction with the Detroit Air-Olympics to be held at that city on June 30, according to an announcement by Karl Zell, general manager of the aeronautics division for the Detroit Board of Trade.

The meeting will emphasize six fundamental processes, addressed by several of the foremost aeronautical and mechanical engineering authorities in the world, and is expected to be attended by more than 4,000 members in the country's aeronautical districts.

Opening remarks will be made by F. H. Lee, chairman of the society's Detroit section. Subsequent speakers, according to the program, will include William D. Stet, general manager of the airplane division, Ford Motor Co.; William F. MacCracken, Jr., assistant secretary of the Department of Commerce, in charge of aeronautics; Edward Cossens of Fairchild Canadian Engineering Corp., Farmington, N. Y.; F. H. Handley-Page of London, Eng.; F. E. K. Horace, professor of aeronautical engineering, University of Washington, Seattle; Dr. S. A. Reed, propeller manufacturer, New York; Alex Dow, president of the Detroit Elkhorn Co., and president of A.S.M.E.; James G. Eng, operations manager, Fyzorun Aviation, Inc., Philadelphia; Charles D. Morris, chief engineer, The Mackinaw Co., Grand Rapids, Mich.; G. L. Works, Jr., of Fitchmeier Transportation Co., New York; J. F. Tracy of Faxon Propeller Manufacturing, Mass. City; Leon Carl Quisen, material division, Army Air Corps, Dayton, O.; Max Scott of Hawaiian Aircraft Co., Waikiki, Kauai; Dr. Carl G. Rosdy, chairman, Design Guidance Committee on Aeronautical Engineering; Gen. W. E. Gilhauser, commanding officer of Wright Field, Dayton, O.; Carl B. Fritsch, general manager, Aircraft Development Corp., Detroit, and V. E. Clark, Bellanca, N. Y. It is expected that Capt. George Hubert Wilkins, Arctic explorer, also will address on the occasion.

Speakers will talk as "Aviation as a Transport," MacCracken on "Aeronautical Activities of the Department of Commerce," Handley-Page on "The Aerobatic Show," Ray on "The Preparation of an Airline for Commercial Operations," and General Gilhauser as "Military Aviation." The other speakers have chosen appropriate subjects.

The Book-Cadillac Hotel will be the headquarters of the engineers while in Detroit.

**Browning Aircrafters Organized in Indiana  
To Turn Out Light Soekely Engineed Plane**

THE BROWNING Aircrafters have been organized in Gary, Ind., for the purpose of designing and manufacturing a light single place biplane, to be powered with a 45 hp. Soekely engine. It is designed to have a high speed, maximum radius of close to 1000 mi. It will be an open cockpit type with welded steel tube fuselage and wooden wings, split type landing gear and Avco shock absorbers. At a later date, according to W. Browning White, president of the new company, work will be started on a two place cabin, multiwing wing design, slightly larger in size but powered with the same engine as the open model. This plane will be constructed of welded steel tubing throughout.

Charles Barnard is vice president of the Browning Aircrafters, with Robert Ahrens as secretary and treasurer, and F. J. Goodrich in charge of construction.

# Fokker Aircraft Corporation

Units { 1 share of First Preferred (\$25 par)  
1½ shares of Common (no par)

Bought—Sold—Quoted

BULLETIN ON REQUEST

**W. C. Simmons & Co.**

40 Exchange Place      New York  
Telephone—Hanover 1991

THANK YOU for mentioning AVIATION

**Wright Cyclone Engines to be Offered  
For Commercial Installation This Fall**

WRIGHT CYCLONE engines will be ready for commercial installation this fall, according to a recent announcement by Charles L. Lawrence, president of the Wright Aeronautical Corp., Paterson, N. J. To date, the Navy Department has ordered the entire production of this 805 hp. engine.

The Cyclone, a large air cooled, radial-type power plant of nine cylinders, is the engine used in the P-12 Navy monoplane which recently established a new world seaplane endurance record of 36 hr. 1 min. 26 sec. at Philadelphia.



**When he "gives her the gun"  
... will the field be clear?**

When the pilot heads his ship into the wind and "gives her the gun," a clear field is a necessity. He has no opportunity to dodge persons wandering thoughtfully about the field—an attempt to change his course will likely end in disaster.

Give pilots all the distance the field affords for taking-off. Keep visitors in a safety zone with a strong Anchor Chain Link Wire Fence.

Anchor Fences are made at all heights and types for every need. Attractive appearance and everlasting service are provided through the Exclusive Anchor Features: (1) U-Bar Link Posts. (2) Square Terminal Posts. (3) Drive Anchorage. (4) Anchor-Weld Wire Gates.

Anchor Nation-Wide Fencing Service places fencing specialists and trained erectors at your disposal. Phone or write the nearest Anchor District Office for complete information.

**ANCHOR POST FENCE CO.**  
EASTERN AVENUE AND 37TH ST.—BALTIMORE, MD.  
Atlanta, Boston, Charlotte, Chicago, Cleveland, Denver,  
Hartford, Indianapolis, Kansas City, Louisville,  
Milwaukee, Newark, New York, Philadelphia, Pittsburgh,  
St. Louis, San Francisco, St. Petersburg,  
Washington, D. C.

**ANCHOR  
Fences**

*Buy the fence with  
1. THE STRONGEST POSTS  
2. THE STRONGEST GATES*

A NATION-WIDE FENCING SERVICE

THANK YOU for mentioning AVIATION

## Bowser Fueling Equipment for Airports

Continued from page 1536

is equipped with a self closing nozzle which prevents completion of delivery at the end of the hose. In the pipe is also located the Bourke-Kado Meter which records the amount of each delivery and also keeps a continuous record of all gasoline passing through the Meter. The individual delivery meter may be reset to zero after each operation when makes it almost impossible to lose track of the amount of gasoline delivered to any plane. In the jet is also located a vapor proof switch by means of which the pumping mechanism is started and stopped.

In operation the switch in the pipe is closed, starting the pump which operates through a by-pass and relief valve, keeps a constant pressure on the tank until the nozzle is opened at the end of the hose. After the required amount has been delivered to the nozzle, the nozzle is closed and the pump again operates through the by-pass and relief valve until the switch is opened, which stops the pumping motion. Any quantity of gasoline, from one to 3000 gal or more can, at this rate, be delivered as a constant steady stream at a speed of 15 to 80 gal per minute. The speed of delivery may be reduced by any desired extent by partly closing the valve at the end of the hose.

The McNeil No. 1000 is built to a volumetric displacement type and consequently accurate under all conditions of flow and pressure. The Exacto Meter is generally conceded to be the most accurate device ever built for measuring the flow of liquid through a cone line.

**Proportion Made for Heating Pits**

A series of proportion pit tanks developed with reliable gasoline, oil, water and air service. Each of these tanks is delivered through a 60 ft. hose with control at the end of the hose and need not make any connections in the piping system. The proportion pit tanks are all built holding from 100 to 1000 gallons. Scale Meters are provided for both gasoline and oil and proportion to each for heating the pit or water through steam coils. The water and oil are conducted out the bottom through a conduct so that even in the severest weather hot oil and water service is available.

All of the equipment in these units is mounted on the heavy 2x12 base so as necessary to make connections in the piping system.

The pumping mechanism consists of a 1½" pump, directly

**TRIPLEX**  
Safety Glass Co., Ltd.

Manufacturers of non-shatterable glass used in windshields and windows of moving vehicles.

*Circular furnished on request*

**HILSON & NEUBERGER**  
Members New York Stock Exchange  
**100 BROADWAY NEW YORK**  
Telephone *Battery 2300*

This is not at the most popular New-Orleans we have ever made. It is more expensive than the 100 because it is made for much harder use. It is designed for the man who runs a lumbermill in his daily business and demands not only superior performance but rugged wear to stand rough handling. We consider the steel illustrated, paragraph 8 to 10 the best high performance. It has but a red handle, some signs of oxidation.



#### 3.2.3. Router 6.0: finding out for guaranteed services

Very short tanks would provide for four different uses which would meet ordinary needs of residential and agricultural

While the stationary equipment means it "easy" ways the cost per flight, for commercial aviation it is "expensive" and mobile equipment has its place also. Many SoCal users consider mobile equipment as a supplementary service to the stationary equipment, using the stationary equipment not only for detailed testing of planes but also for supplying the mobile equipment. Other fields may use the mobile equipment for primary service. Because of the adjustability of testload equipment, it is easy to use one equipment, the equipment will be an all-weather fixed-base mobile equipment for

Because of Co. 10's had extensive experience in designing mobile mining equipment and in building a large number of mobile mining units, it was able to make these.

While standard mobile units will undoubtedly be offered to station authorities to develop, Bowes & Co. is in a position now to equip the standard track classes with fueling equipment giving similar service facilities to those incorporated in its railway apparatus.

## The Aero Craft "Aero Coupe"

Downloaded from www.asmscience.org by

Diagram of the Aero Coupe has presented in building a fuselage of excellent streamline shape, of the same time keeping the cockpit large enough to accommodate two and seated side by side. The fuselage is exceptionally compact, of welded steel tubing. Bracing is effected at the same points. Flying on the fuselage is composed of spruce strips as plywood formers, the resulting planks giving the fuselage a well rounded appearance. The Warner engine, but 35 hp horsepower, makes possible a splendid maneuvering along the

**CLAYTON  
&  
LAMBERT**  
MFG. CO.  
*Detroit, Michigan*

entire body. Like the wings, the fuselage is slip-covered with Flighitek, and finished with five coats of clear lacquer, and two coats of dark blue lacquer. Steel work in the fuselage interior is covered with white primer and lacquer.

Casted surfaces are all of steel anodized, and fully covered. Elosures are of one piece. The fin is adjustable on the ground, and the rudder is adjustable in the air by means of a lever. The rudder, the rear having a wide range of movement. The tail section ribs of the Aero Coupe are of lightened sheet steel, the sections being attached by means of hinges and the strap type, making for increased aerodynamic efficiency and strength.

#### Spiral Type Stabilizer Used

Another feature incorporated by means of making for more dynamic efficiency is a spiral type stabilizer, that neither being affixed in either side of the fuselage. The plane's stability is brought by two streamline take-offs, with adjustable ends. Two streamline wings have the fin. The rudder is balanced. All tail surfaces are constructed in diamond, and are of pleasing contours in shape.

In the landing gear right type units of seamless, heat-treated, all steel tubing are used. The units are finished in chrome nickel-vanadium, and streamlined. The lower units are composed of vanadium steel bars, lightened, and fitted with Teflon roller bearings. On the Aero Coupe the lock out is inside the wheel hub, and the hub is faced with an aluminum cap. Wheels are of six foot tread, and well ahead of the center of gravity. Chrome nickel-vanadium, carbon steel, heat-treated, stainless steel, tubing, and hard shock struts complete the construction of the landing gear. The seats and radios are all built on the bottom of the fuselage main fairing, while the shock struts are attached to the underneath supports. Radio equipment includes and 25 ft x 4 tons are part of the equipment on the wheels, the brakes being controlled through cables and foot pedals in the pilot's cockpit.

## Galt Joint Union High School and Junior College GALT, CALIFORNIA ANNOUNCES

A complete four year educational course beginning the junior year of High School work and ending at the completion of the Sophomore year of College, especially preparing high type young men for the Army and Naval Cadet Schools and higher engineering schools. All work, including fifty hours of dual flying instruction, is given gratis. This work and also post-graduate work is limited to a select group of students whose character and past training, including a rigid physical examination, is passed, and who are finally selected by the admissions committee.

The Galt Joint Union High School has aroused national and world-wide interest during the last two years as the first High School known to seriously introduce flying and aeronautical work as a public four year High School. During the past year, gifts from the Government and other sources in aeronautical equipment have exceeded the sum of \$100,000.00, including the latest and most modern planes. Owing to the demand and the large amount of

equipment on hand, the Board of Education has established a Junior College course in addition to the High School work, the college work being accredited by the University of California.

The Galt Joint Union High School and Junior College is located in the famous Sacramento Valley only four miles north of distance from the famous Governor's Mather Field. The school has its own flying field, adjoining its buildings and is one of the model fields of the valley, having graded runways in all directions and capable of handling any amount of traffic.

#### Admission

Students are expected to make formal application for admission to the High School and Junior College upon blanks supplied for the purpose. Information is sought by the State, not only concerning the scholarship of the students but also concerning their char-

acteristics fittings on all forthcoming models will make installation of postage possible. The plane's tail fin is constructed of round chrome nickel-vanadium, extruded, but not removable from the cockpit. Conventional sheet fittings, with a shoe, and Oscar shock absorbers complete the assembly. The complete unit, assembled in its upper portion through an aluminum base in the side of the fuselage, can be taken out by removing these pins. The ground angle is 14 deg.

The Aero Coupe is powered with a seven cylinder, radial engine, 210 hp. Warner "Gullwing" engine, the engine mounted in a type of truss, balanced, and the engine mounted on a single shock strut, the front of the engine being supported by the anodized hood type, and quickly detachable by means of snap fasteners. Ventilation to the engine is secured by means of louvers located adjacent to the fire wall.

Two main 20 gal. gasoline tanks, located in the center section, feed the engine by gravity. The tanks are made of welded aluminum and are mounted in steel tube cradles. Eight gauges drop below each tank. Filters are easily installed. The outlets are built in the outside front of each tank. All fuel and oil lines are copper, with unreamed three way valves and self-sealing balls. The oil tank, for gallons in capacity, also is made of welded aluminum. As aluminum has low heat, and a Pyro-Plyer arrangement, the tank located to the right of the pilot in his cockpit is provided no safety precautions.

The present model is equipped with a Harwind propeller, Y.H. 9 in. in diameter, although the pitch has not yet been decided. The engine has no shakers, although provision has been made for one. Controls for the various sets of the packed variety.

Wiring on the plane provides for interior and running lights, for radio communication and an electrical start. The exhaust system is of the usual collector ring type.

The Aero Coupe will seat two passengers, side by side, sur-

an order of gravity, the pilot being located behind and above the passengers' cockpit. The cockpit are spacious rooms, that for the passengers being 40 in. wide inside, and 40 in. high. Instrumentation in the pilot's cockpit is practically the same. Usefulness of gas turbine aluminum leather, gray in color, forming a pleasant contrast with the dark blue interior of the fuselage. The walls of both cockpits are lined with leather, bucket seat-boats are upholstered with leather. Deep cushions, quickly detachable for the substitution of padded seats and safety belts, complete the interior fittings. The belts are of web, red and are specially made.

Accessibility to the pilot's cockpit is facilitated by means of conveniently located steps and handles. For the front cockpit wide walk on the lower wing panels in conjunction with a large door on the left hand side of the plane make for easy access or egress. Visibility is excellent from both cockpits, due to a combination of flaps, and inverted which are the adjustable seats, the tapering small nose fuselage, stagger, and the low position of the upper wing.



The Aero-Coupe "Aero Coupe" powered with a 210 hp. Warner "Gullwing" engine on exhibition at the All-American Aircraft Show at Detroit.

which is almost on a level with the pilot's seat. The pilot's windshield is of triple, three plies, and large enough to shelter the cockpit as well as provide unobstructed vision. Windows in the passenger's cockpit are of Pyrex, and a heater is provided in the cockpit's floor, making use of heat from the exhaust gases.

An Eights seat control instrument board is provided for the pilot, while in the front cockpit a five instruments are grouped in the center of a board, hinged at the top, to provide access to the luggage compartment forward of that cockpit. All fittings and trimmings in the cockpit are erosion plated. The floors are of plywood and carpeted. A second luggage compartment, large enough to accommodate two good sized suit cases is provided behind the pilot's cockpit and accessible from outside the plane.

#### Dual Stick Type of Control

Controls are of the conventional dual stick type, having downhaul tube sticks, with rubber grips. Double cables are provided to the elevators and the surfaces are controlled by means of dual take pack seats. The stick in the front cockpit is easily removable and safety clips are provided for holding it. The rudder is controlled by adjustable foot pedals of underslung type, single cables being utilized.

Braking screws of pyralin are provided in the wings at eleven control hinge points.

It has been stated by the manufacturer that the design of the Aero Coupe has been worked out in accordance with the Department of Commerce specifications. The ground dimensions indicated are as follows:

Length overall	26 ft.
Height overall	8 ft. 6 in.
Span upper wing	22 ft.



## THE AIRMMASTER COUPE

## Beauty and Style mark these two- and three- place personal flying ships.

Price (Subject to Change)  
\$1,375 and \$3,000  
with Left-hand Engine

We're on Your Way to Dealer Territory Now Open  
**OHIO AERO MANUFACTURING  
CORPORATION**  
Youngstown, Ohio

Spare, lower wing	28 lb.
Wing area	250 sq. ft.
Leading gear trend	6 lb.
Ported plane	Warren Scarab 180 hp at 3000 rpm
Wing, single-surface	1100 lb.
Pax load	500 lb.
Useful load	1800 lb.
Gross weight	3115 lb.
High speed	115 m.p.h.
Cruising speed	100 m.p.h.
Climb	590 ft./min.
Service ceiling	12,000 ft.
Crosswind	800 ft.

## The Warner "Scarab"

Continued from page 1626

exposed, as are the rocker arms, as far back as the follower point. Behind this, the valve mechanism is housed in an aluminum alloy box, the aluminum cover of which may be easily removed to make height adjustments. The valve gear assembly is thus protected from dirt, while the springs are exposed for cooling purposes. The rods of the box also act as supports for the rocker arms and are held to the cylinder head with two 5/16 in. bolts. The rocker arms operate on a bronze bearing fabricated by the Babbitt Metalizing Company. The cylinder heads are sheet metal bolted to the barrel. Eight bolts are used to attach the head to the barrel and eight bolts are used to hold the cylinders to the crankcase. The skirt of the cylinder barrel projects about 1½ in. into the crankcase to prevent surplus oil from running into the cylinders. Permanent cold portions of Bohlerite are used. They are flat head design with two American Brassworks compression rings and use Perfect Circle oil scraper ring. They



Showcasing the construction of the Warner "Scarab" in a Peoria airplane, "Cakewalk".

are plugging the pin. There are six separate oil leads from the crank pin to each lead rod bearing.

The crankshaft is a single piece machined on all surfaces. It is very short, making for greater stiffness. There are two main bearings and one float bearing. The propeller hub flange is split on to the crankshaft and is part of the engine. In the rear is the auxiliary drive, connected to the crankshaft by an aluminum coupling.

The two cam rings in the rear are each one-piece forgings,

## Edo Pontoon and the Ryan Brougham



in a beach upon making landing and absorbing wave conditions.

THE Ryan Brougham, the sky master built by Brougham and made possible by an acre of wings, has now proved its quality as a seaplane. And what a beginning! With an exceptionally quick take-off and the best possible performance of the Brougham hardly affected by the weight of floats, it became a natural leader in the class of Wright ratings. Only Seaplane

With so wonderful performance the Ryan Brougham Seaplane continues through the air with the same smoothness and quietness with the full and wide decks of the Brougham, provides every conceivable means of safety. The hull is built of mahogany and to my knowledge is the only hull built of mahogany at the stern and at the bow allows the ship to be brought close

to the water, thus allowing the Brougham to be moved to open and sheltering air without fear of frequent launching which would hinder operation.



EDO AIRCRAFT CORPORATION  
COLLEGE POINT, L. I., N. Y.

STANDARDIZED ALL METAL SEAPLANE FLOATS

with the gear on the inside, an integral part. The cam rings and one at ½ engine speed and each has four lobes. In association with the rings are the solar followers working in pairs and model aluminum valve guides and operating domes made with pressed bell seats. The push rods are enclosed in aluminum tubes and are fitted with roller supports at the upper end.

The crankcase is made up of two heavily ribbed halves joined on the outer face of the cylinder. This construction is said to facilitate the cleaning of the crankcase rod and crank bush as a unit, reducing production costs. In addition, it permits uniform and sound castings and eliminates a number of assembly problems. It is made of aluminum alloy. The intake manifold induction system is carried off a separate casting bolted to the rear of the case. It consists of a circular induction ring with the manifold pipes mounted to it and bolted to the sides of the cylinder. The mounting ring is integral with this casting. It is circular with a diameter of 12 in. having eight mounting studs.

Mentioned below and to the rear of the cylinder is the Brouhard MAG 5A carburetor with the intake heated by the



A Ryan "Pioneer" fitted with a 120 hp. Warner Scarab engine.

exhaust gases of the two lower cylinders. Between the carburetor and the intake manifold is the air scoop, connected to the passenger oil pump which feeds to the oil tank, from where the oil is forced by the pressure pump to all of the plain bearings and by splash to the cylinders. The engine is equipped with two Solex magneto, each mounted at 25 deg. from the center line so as to make them more accessible and to allow for the mounting of a starter between them. The magneto are driven through bevel gears, on EBB ball bearings, from the counter shaft coupled to the crankshaft.

The general specifications are the Warner Scarab engine as follows:

Type	Single cylinder, static radial, air cooled
Number of cylinders	7
Number of valves	8
Propeller drive	Front
Exhaust	Front
Rated power	120 hp at 3000 rpm
Rated speed	130 mph
Maximum power	120 hp at 3000 rpm
Maximum speed	130 mph
Weight dry, without tank or starting	279 lb.
Specific weight	3.05 lb. per cu. ft.
Estimated fuel consumption at rated power	.80 lb./hp/hr.
Estimated oil consumption at rated power	.05 lb./hp/hr.
Empty weight ratio	5.2
Max. flying pressure	122
Bore	4.56 in.
Stroke	4.75 in.
Displacement	622 cu. in.
Diameter	3500 in.
Overall length, without start	277 in.
Length of mounting ring	17 in.
Spanwise width	40 in.
Overall width	10 in.
Ground clearance	10 in.

THANK YOU for visiting AVIATION!

# MODERN FLIGHT

STUDENT PILOTS and young men about to enter the game can cut down the number of hours usually necessary before making by a study of the greatest flying instruction book of the year, Modern Flight.

### CHIEF PILOT CLEVENGER

out of the wealth of his 10 years flying experience explains in simple language the mechanics of the most important of the crafts for intercept, landings, straight flight and aerobatics.



SAVES YOU \$50.  
when you LEARN TO FLY

The ambition of every flying student is to be able to handle a ship alone in the least time possible. Purchase of Clevenger's Modern Flight is a long step in that direction.

### HERE IS MY DOLLAR

Each copy of Clevenger's complete flying

course

Price \$10.00

Address: 101 W. 45th Street, New York, N. Y.

Member of the Board of Directors

Em. 400, Alexander Hamilton Hwy., Dayton, Ohio.

Streetsburg, N. H. 04

Telephone: 4-1212



June 4, 1938

# A Record to be Proud of



**There has never been a structural failure with an American Eagle**

The American Eagle has never been defeated in any performance contest.

Send for this new booklet, it fully illustrates and describes that most wonderful performing, beautiful

## "Master of the Skies"

We want you to know America's Eagle because we know you will be proud of its amazing performance, maneuverability and beauty as we see in the privilege of holding it.

With OES Motor, Stomper Propeller, Burroughs American Control — E-200, Kansas City



American Eagle Aircraft Corporation

2006 East 13th Street  
Kansas City, Missouri

Approved

## Log Books

Aircraft—Engines—Pilot Flight Tested Cards

These log books are necessary for government and insurance companies to get the complete information that gives you record of your flightable aircraft. These books are sufficient for one year's use. Size 5½ x 8½ inches. Every pilot, ship and engine should have a log book. They also make books for sets of 2 books.

### PRICES

White Record Cards, per dozen	\$1.00
Almond Log Books, each	\$1.00
Black Log Books, each	\$1.00
White Log Books, each	\$1.00
Almond Record Cards, per dozen	\$1.00
Black Record Cards, per dozen	\$1.00

OES Engine Manuals, \$2



Nicholas-Beazley Airplane Co., Inc.  
310 English Street, Marshall, Minnesota

THANK YOU for supporting AVIATION

stated show that as far as the arrangement is a success. The present naval reserves are an armament of the older "total reserves force". It was created under the provisions of an act of Congress approved Feb. 28, 1925, which became effective July 1 of that year. There are three classes provided in the present naval reserves. The letter "E" after the name is used to designate a member of the Fleet Naval Reserve. Merchant marine naval reserves are designated by the letter "M", while a "T" appears in the official records after the name of those belonging to the Volunteer reserves.

Under each of the three divisions, a number of classifications are provided. The letters "E-E" designate an officer of the deck division, who is a member of the Fleet Naval Reserve. The letters "E-E" are used to distinguish all others in the fleet reserves assigned to engineering duties. In each classification, the first letter denotes the type of duty which the officer is qualified to perform, while the second letter tells whether he is a member of the fleet, merchant marine or volunteer reserves. Officers of the reserve merchant marine service are the class designated "M-E", indicating that they are relatives of the fleet reserves.

Deck officers, engineering officers, officers qualified for both deck and engineering duties and service officers are considered officers of the fleet and wear the same uniforms as those prescribed for officers of the corresponding rank in the line of the regular Navy. Officers of the supply and medical corps wear the insignia with the insignia of their bureaus



An "NTW" plane warming up at the Naval Reserve Station  
Base at Great Lakes.

are in Detroit, Minneapolis, St. Louis, Los Angeles and San Francisco.

In addition to the drill periods, the reserves are allowed to spend 10 days on active duty at one of the reserve aviation bases or at a regular naval air station as a means of further maintaining efficiency. Thus, they are taken in flying the older and more types of aircraft planes. In the majority of cases, less than four hours of flying time is established with but 15 days' active duty. Most of them request longer training periods. It is a common comprehension also is found a dozen or more at the various reserves bases each year and throughout the year, "just getting in a little flying time".

"It's far for we have made only a beginning in the training of reserves," another officer enthused in the Bureau of Navigation conceded. "However, our training of reserves is working out exceptionally well. We are now making an effort to distribute flight experience to our various squadrons so that they will have a home place and places of the proper type to fly. There is every indication that we shall accomplish this in part during the coming summer."

While the work of furnishing the squadrons with equipment progresses, Navy Department officials have not been idle. They realize that to obtain the greatest amount of value from the organization, the reserve aviators must be indoctrinated in present-day aircraft maintenance and tactics. They must learn also the relation aviation bears to the Navy under the present doctrine.

With this in view, 100 of the reserve aviators, commissioned since 1925, are now performing a year's training duty with the fleet. The training began July 1 last year. Twenty-four of these officers are assigned to observation squadrons, 12 to torpedo and bombing squadrons, 10 to general utility squadrons and five in fighting squadrons. These figures are the showing of official Navy records. When the year is completed these men are expected to be well qualified for the training in squadrons which is to follow. It is explained that this system in all probability will be continued indefinitely. Reports received by the Bureau of Aviation from the various stations, ships and squadrons to which the reserves are

assigned show that the arrangement is a success. The present naval reserves are an armament of the older "total reserves force". It was created under the provisions of an act of Congress approved Feb. 28, 1925, which became effective July 1 of that year. There are three classes provided in the present naval reserves. The letter "E" after the name is used to designate a member of the Fleet Naval Reserve. Merchant marine naval reserves are designated by the letter "M", while a "T" appears in the official records after the name of those belonging to the Volunteer reserves.

Under each of the three divisions, a number of classifications are provided. The letters "E-E" designate an officer of the deck division, who is a member of the Fleet Naval Reserve. The letters "E-E" are used to distinguish all others in the fleet reserves assigned to engineering duties. In each classification, the first letter denotes the type of duty which the officer is qualified to perform, while the second letter tells whether he is a member of the fleet, merchant marine or volunteer reserves. Officers of the reserve merchant marine service are the class designated "M-E", indicating that they are relatives of the fleet reserves.

Deck officers, engineering officers, officers qualified for both deck and engineering duties and service officers are considered officers of the fleet and wear the same uniforms as those prescribed for officers of the corresponding rank in the line of the regular Navy. Officers of the supply and medical corps wear the insignia with the insignia of their bureaus

of the service. Upon completion of the aviator course and appointment as ensigns (A-E) U.S.N.R., each man is paid a gratuity of \$100 for the purchase of the required uniform. Members of the naval reserves are to wear the uniform of their ranks and ratings when at drill, the naval reserves regiments, specifically. The weekly drills or periods of equivalent drill required of aviation officers are required of all members of the fleet reserves. To obtain credit for these drills, the aviators and men must record their hours of duty. Duty is the maximum number of hours that may be performed for pay per month. For the performance of this number, the officers will be given one day's pay for each drill.

The yearly 10 day active duty period, which aviation officers perform, likewise is performed by members of the other branches of the fleet reserves. The duty is of course of a different nature. For this service, the officers and men receive the same pay and allowances as are received by those in the regular Navy of the "same rank, grade or rating and length of service." Officers and men are "detailed for training

**Safer!**  
—this new  
tie rod terminal

Tighten the lock nut as much as you will—you cannot bent the terminal or break the tie rod. New, stronger, safer, better. Lock nut screws on to the terminal instead of on to the rod, avoiding torsional and tensile strains, giving closest thread fit. Write for detailed information. Macwhyte Company, 2905 Fourteenth Avenue, Kenosha, Wisconsin.

**MACWHYTE**  
*Streamline and Round Tie Rods*  
Patent Safe Lock Terminals

"For Safety in the Air, — Everywhere"  
No detail of the

## IRVING AIR CHUTE

has been left wanting to serve—especially of early design private emergency parts of severe service are in demand of comparative late. Details of all Air Forces of the United States, Great Britain and of other Countries.



OVER 100 LIVES SAVED IN EMERGENCY,  
OVER 8,000 SUCCESSFUL "LIVE" DROPS.  
OVER 30,000 SUCCESSFUL TEST DROPS.

Illustrated Brochure on request

**IRVING AIR CHUTE COMPANY, Inc.**  
372 Pearl Street  
Buffalo, N. Y.

Code Address: "Irvin Buffalo, N. Y. U. S. A."

THANK YOU for supporting AVIATION



Reproduced in our full aerial size

## This BALL BANK INDICATOR *Makes Flying Safer*

EMIL DAIBER  
3256 W. 86th St., Cleveland, Ohio

## A BARGAIN



### This Three Place Metal Hull Aeromarine Flying Boat

#### JUST OVERHAULED

original cost \$15,000—Our price \$4,500

An ideal boat for passenger carrying or pleasure.  
Drawn less than 120 hours.

Maximum 35  
High Speed 15 m.p.h.  
Fuel load 750 lbs.

PAUL GERHARD ZIMMERMANN  
21 CLIFF STREET, MISTIC, CONN., Tel. Mystic 214

THANK YOU for supporting AVIATION

or other duty as aviation which involves annual flying or aircraft, in accordance with orders issued by the Bureau of Aviation,<sup>1</sup> are entitled to draw \$6 per week of their base pay as additional. This is known as the service as "Flight Officer."

Four or more years of service in one grade is required of a Fleet Naval Reserve officer before promotion to the next highest rank. In these four years, the officer must have spent at least 90 days in active duty. Professional examinations are given to determine his fitness for holding the next rank.

In addition to these requirements, an aviation officer must have had 125 hr. in the air as an aspirant before he can be promoted to junior grade lieutenant, 325 hr. in the air to the rank before he is eligible for promotion to lieutenant and 350 hr. in the rank of lieutenant before he can be made a lieutenant commander. He must also satisfactorily pass a flight test.

Student reserve aviators are enlisted in the volunteer service when they have partially completed the ground training and it has been determined that they will in all respects



Impressions on Wright Whirlwind engines being given at Rockaway Beach, L. I., Naval Reserve Aviation base. Left: John Trennan, commanding officer; to right from the left:

quadriplane for flight training. Members of the volunteer reserve are not required by law to perform any training. They may perform drills if they choose, but they receive no compensation. They may be personnel on their own application to perform the same training duty given members of the fleet reserves. For this duty they receive the same pay and allowances given fleet reserves.

"All student aviators must be enlisted as second class men and remain in that rating until they receive their commission as second class." Promotion from the Navy Department is possible. "They should be enlisted in class V-5. When they have completed primary flight training, they should be transferred from class V-5 to class V-6. They must be promoted with the necessary audience before they are entitled to a rank for flight training. Impressions on them will not be the senior's audience, not more than two successive, the commanding officer need not witness the issue of complete outfit, but only such dress as are deemed necessary."

Class V-6, to which the student aviators are transferred before beginning their primary training, is for student aviators enlisted as second class only. In joining the reserves, the prospective student aviator enlists for a period of four years. The transfer to class V-6 does not affect his enrollment. However, the regulations stipulate that "student aviators of class V-6 will be eligible for commissions as aspirants in the Naval Reserve after the successful completion of their course of training."

## Welding Equipment for Aircraft



Left: No. 3 Welding Gun  
Right: No. 3  
Welding Gun  
with  
power  
source  
and  
circuit  
board  
for  
parallel  
welding  
work.

**THE SMITH** Welding Equipment Corporation is the exclusive manufacturer of oxy-acetylene welding and cutting apparatus. A complete line of equipment for every kind of aircraft welding is available, whether for single construction, repair, or maintenance. Smith Welding Equipment is used in the construction of Travel Air, Douglas, Cessna, King, Knicker-Boomer, and other planes, and in many repair shops. Distributors of Smith Welding products are to be found in practically every important city in the United States, Canada and Mexico.

**SMITH**  
Welding Equipment Corporation  
3019-33 Fourth St., S. E., Minneapolis, Minn.



Powered with Whirlwind,  
Ryan-Melvin, Caninez and  
OX5 engines

Advance Aircraft Company  
Troy, Ohio

## ABC of Flight

By W. Lawrence LePage

With a foreword by the Secretary of War  
For the Aeromarine Edition, F. W. Weare

An elementary volume in non-technical language on the fundamentals of flight, the airplane and the present problems of flight. It requires no previous knowledge of flying or mechanics and is intended for an audience too ignorant to benefit from instruction in the art of piloting.

Book Department  
AVIATION PUBLISHING CORPORATION  
210 West 15th Street  
New York City

## SIDE SLIPS

By ROBERT B. OSBORN

As the news may not have reached some of the members of Aviation who have been working hard and worrying along all these years in the hope that some day "Newspaper headlines" might be saved and notably added to something, we hasten to spread the good word. We too, had almost given up, after ten years of toiling and studying and hoping and hardly existing on starvation wages—so were you going to climb back to the old home town and seek for the old job as the fiery boy, when the glad tidings reached us. Boys, why were saved. The answer is the Princeton graduating class have started to take up aviation as a life-work.

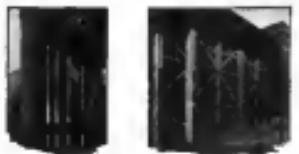
When this news reached the public through the newspapers, Curtis and Wright stocks soared to new high marks on the New York Exchange. H. L. F., Jr., a graduate of Harvard, who drafted into the office a white sign, claims that this activity in the market is only because of the announcement of Colonel Langley's connection with Transcontinental Air Transport.

The people who are most puzzled and amazed by the prices aviators and aerodromes are willing to pay for aerodrome stock are the old-timers in the business. The gleaming stars—those who sold their holdings in the tinfoil and fifteen-cent cars who sold short at the hundred-and-fifty-cent place, claim that this is the first time in aeronautic history that an altitude record and a distance record have been set at the same time.

A racing car was recently timed out on a German racetrack, using far precipitation a number of rockets mounted on the chassis of the car, the rockets being ignited in rapid order by the driver. As a speed of 130 m.p.h. was obtained, and the experiment appeared to be successful in every way, the inventor is now planning to put the same power device in an airplane. His plan is that with such a machine flights from Berlin to New York will be made in two and a half hours, thus accomplishing to be realized in five years or so. If we were running the rocket ship on the first attempt to make this flight, and we are willing to bet anybody at any odds that we won't be, it would be just our luck to get in mid-ocean and have our faithful cigarrete-lighter fail to light for the first time in history, preventing us from reaching off the rockets necessary for the rest of the trip. The girl cigarrete-lighter has been working as faithfully than far, we are not afraid to hang it out in crowds of five or more, so we are suspecting it of failing us just a sense of security go to that it can fail to light at a really acute moment.

Mr. F.P.A., esteemed columnist of the New York World, has suggested that the panacea to end the curse of Colonel Langley's flight was the flight of the famous New York-Paris flight. The suggestion, when it was made, should be placed on the Hall-of-Fame Induction. The conclusion is a good one, if there could be some assurance definitely exhibited and identified with the planed. "The job short in the opinion of many competent to judge, the first man-carrying article of clothing capable of sustained flight dashes on the part of Colonel Langley after his New York to Paris flight, which could have been made in the Langley Aerodrome."

THANK YOU for supporting AVIATION



## Let Truscon Solve Your Door Problem

Toronto Airplane Hangar Doors compare uniformly space-savers, economy, convenience and economy large glass areas for daylight observation. Trunks and containers with corners reinforced and electro-welded. Fireproof, waterproof, weather-tight, and non-corrosive.

Write for complete information and catalog  
**TRUSCON STEEL COMPANY**  
YOUNGSTOWN, OHIO  
Manufacturers and Distributors of all Products Under

**TRUSCON**  
COFFER ALLOY STEEL  
AIRPLANE HANGER DOORS  
Straight Slab and Curved Track Types

## SITKA SPRUCE

All class selected spruce for AIRCRAFT. Spruce will withstand severe fire insulation applications — all sizes — all lengths. Spruce has fire insulation qualities, small expense objectives made easy and very economical. Our unique planing mill can open spruce sizes quickly.

**YOHO & HOOKER LUMBER CO.**  
Aircraft Department

240 WING BUILDING, YOUNGSTOWN, OHIO

### Where Conditions are Most Exciting

  
Use  
Ferdinand  
Special  
Aviation  
Glass

Write for booklet

**L.W. Ferdinand & Co.,**  
103 Franklin Street, Boston, Mass.

THANK YOU for visiting AVIATION

## FOREIGN NEWS

By Special Arrangement with the *Transportation Gazette*, Bureau of Foreign and Domestic Commerce

### Sets Load Record in DH "Hound"

Flying a DH "Hound", Hubert Broad recently established a new record in England when he maintained an average speed of 190.641 mph with a load of 1,000 kg. (2,204 lb.) of lead. He flew from Stage Lane Aerodrome, Edgware, to Hatfield and back, a distance of more than 60 miles, in 26



The DH "Hound" at the Stage Lane Aerodrome shortly before the record flight.

min. 10 sec. The biplane is powered with a 550 hp. Napier Heron XI engine.

Broad's record breaks the mark set by M. Laine of France, who in 1925 flew a Hispano-Suiza 42C-1 powered with 580 hp. Hispano-Suiza engines over a specified course and with the required load at an average speed of 153.039 mph.

### Nearly 400 Acres at Croydon

London's reconstructed Croydon Airport will cover nearly 400 acres, according to a report from Trade Commissioner William M. Pugh at London, who states the airport is now nearing completion. More than \$1,000,000 has been spent.

Among the principal features of the new airport is a large main building with a 220 ft. frontage, housing the Air Ministry's administrative offices and the various British and foreign air companies using the terminal. To the left of this building are the large surface hangars, which are 360 ft. long, 100 ft. deep, and with a height of 30 ft. above the floor. Together the two hangars are 1,700 ft. long, the largest hangar being 1,000 ft. long. Behind these hangars are up-to-date work shops and repair sheds. On the right side of the administration buildings is the new hotel containing 60 bedrooms, most of them with baths, for the use of air passengers arriving late at night or departing early in the morning.

### East Africa Begins Plane-Road Service

With the recent arrival of the North German Lloyd liner *Columbus*, the Luft Hansa road airway between Europe and East Africa has begun. This plane met the last, both passengers and mail, and flew to Berbera, arriving fully seven hours ahead of the train. An eight passenger plane was used to inaugurate the service.

### De Pinedo Leasing Seaplane Fleet Cruise

A cruise of the western portion of the Mediterranean including stops at Barcelona, Cartagena, and Cadiz is being conducted by Comdr. Francisco de Pinedo of Spain. If so, 38 seaplanes are carrying more than 200 persons on the route, it is reported.

## AIRPORTS AND AIRWAYS

### Eiko, Nev.

By Robert E. Blackstone

Eiko, a refueling stop on the transcontinental airway between St. Louis and Reno, has a municipal airport less than a mile west of town and right off Victory Highway. At first an east-west runway of 2,700 ft. was leased, but that is now being increased to a mile. The north-south runway is 2,700 ft. and is being increased to 2,900. The prevailing wind is west.

The field has an 80 x 100 ft. hangar which can house five planes and off and minor repairs can be had at the field as well as the service of two mechanics.

R. W. Baker and R. G. Hollford, Department of Commerce radio operators, furnish weather reports and receive and transmit radiograms of arrivals and departures of airplanes. Baker is in charge of the radio station. He is a former manager with seven years experience in that line. He was recently promoted to his present position when G. W. Larson was transferred to Concord, Calif.

J. L. Farren is in charge of the field for the Boeing Air Transport Co., W. C. Wiggett, manager, and Farren takes care of all repairs.

On a little hill back of the Eiko field the Department of Commerce is building a 35 ft. tower for a beam. Eiko will have a radio beacon when night flying begins.

The Eikoians are proud of the fact that they are on the transcontinental airway and disseminate it every time they



Boeing Air Transport plane refueling at the Eiko Airport Field Manager J. L. Farren, left, and W. C. Wiggett, manager, right.

put a claim, by making improvements suggested by survey committee engineers. The city immediately agreed to install heavier lights and lengthen the runways. That latter will include the laying of more land.

### Little Rock, Ark.

By Harry C. Smith

An air committee, to investigate the possibility of the establishment of an air mail route through Little Rock, was recently appointed by W. C. Edwards, president of the Little Rock Chamber of Commerce. Members of the committee in that city might be named as one of the stations en route. Edwards' committee will travel from Cleveland and Louisville through Memphis and Little Rock to Dallas, have been traveling for several days. The duty of this committee will be to interview the railroad, and find what accommodations must be offered to pack the mail. Members of the committee are to include: W. L. McDaniel, a banker; Edwards; J.

A. Geraschenko, postmaster; J. Carroll Goss, commanding officer of the 156th Observation Squadron, Arkansas National Guard; Maj. Robert Collier, commanding officer of the Little Rock Intermediate Air Depot; Lt. Gen. D. L. White, Department of Commerce aircraft manager, and Robert White.

The first of a series of cross-country flights in his campaign for governor of Arkansas was made recently by Maj. J. Carroll Goss, commanding officer of the 156th Observation Squadron, Arkansas National Guard, and present soldier of the state, to Walnut Creek, Ark. Major Goss was flying an American Eagle plane donated to him for the purpose by the Polar Bear Motor Co. of Pine Bluff, of which he was formerly sales manager. He uses his plane to make a flight to the east town in each of the 72 counties in Arkansas, if it affords enough level space for him to land his plane upon.

### St. Louis, Mo.

By M. L. Alexander

St. Louis has been selected as the first week-end stop of the more than 40 airplanes which are to compete in the Ford Reliability Test. The planes are scheduled to arrive at Lambert-St. Louis Field as the afternoon of June 30 from Indianapolis and will depart on July 2 for the rest of the 6,000 mi. tour. At least two St. Louis made airplanes will be entered. It is understood that a Ryan Brougham entered in the competition will be piloted by Philip R. Lowe, flying mate of Colonel Lindbergh in the Army and air mail service and has agreed on the Brougham's entry fee. The other St. Louis plane, a Curtiss "Hebil", is still without a pilot.

Maj. Albert Wood Lambert, boss of St. Louis Birm. will be in command of the field for the Ford tour, assisted by T. Prentiss, Safety World War pilot, who is also Mr. Lowe's partner in a firm of airport executives. A fund of \$25,000 is to be raised by an Air Board committee headed by Gliese L. Parks, to defray the expenses of the Ford crew.

### Ford Tour Participants Arrive

Ray Collins and Ray Cooper, the pathfinding expedition for the Ford tour, stopped off at St. Louis recently on an Army Fokker piloted by Lieutenant Stinson. They expressed themselves as pleased with preparations made here for the team.

Hughson P-9's of the First Pursuit Group dropped in at Scott Field recently, en route from the spring maneuvers at Fort Lawton to the home station at Selfridge Field, Mich. The planes, flying in formation and headed by Capt. Frank E. Prichard, presented 32 sections of various types which came together as a passenger in a Fokker was Brig. Gen. Frank Parker of the General Staff. He was piloted by Maj. John D. Brooks.

Jack Merrill—"Lucky Jack" by calls himself—had a narrow escape when he parachuted down onto a mass of today's vines at Parkers Airport in a recent Sunday flying exhibition. The plane stalled over trolley and gas vines and the short-circuited engine exploded while Merrill hung on his harness with his feet six feet from the ground. After some minutes he was released by other than who brought a ladder and held it for him while he unhooked his harness and climbed down.

Lucel Jolina Jahnepeter, who has given the 25th Division Air Service's new planes more hard work than any pilot in the squadron, has joined the instruction staff of Robert





## Airport Equipment Division Is building for

Burlington County Aero Club of  
Moorestown, N. J.

Williamsport Airport, Williamsport, Pa.  
Ensuring them of

- 1—Complete design and layout of hangars.
- 1—Complete erection.
- 1—Interlocking piles for roof and sides, with exceptional strength and low cost.
- 4—Elevation of wings—overlapping at points or corners.

Phone, wire or write

Aircraft Equipment Division of  
THE MARYLAND METAL BUILDING COMPANY  
26 Pennsylvania Building, Philadelphia, Pa.



### HELMETS and SUITS

that approach perfection. Standard for Army and Navy fliers. Also worn by real racing pilots everywhere.

### CANVAS - LEATHER SPECIALTY COMPANY

31-39 One St., Trenton, N. J. U. S. A.

## Learn to Fly in San Diego, Air Capital of the West

### RYAN FLYING SCHOOL

Perfect year round flying climate. Modern equipment. Small classes. Instruction individual. Close to largest Army, Navy and Marine bases in the world. Write for general information.

**RYAN**

Ryan Flying School, San Diego, California  
Affiliated with Pacific Technical University

TRADE TWO for continuing AVIATION

tions. Two hours is the time elapsed between the two visits. An entire commission delegation recently flew from South to the city to attend a session of the West-Made Bank Co. The representatives covered all the space for the day in the West Coast "Cessna".

Another group of aviationists—yours, the Metropolitans! Left Los Angeles yesterday, and the same plane is going to a "real" Tacoma, Wash., meeting.

### Washington, D. C.

Two Boeing P-26 pursuit planes, each equipped with the Gerdes D-22 engine of 600 hp., landed at Belling Field, Washington, D. C., May 16 after a 3,820 mi. flight from Puerto Rico, Panama Canal Zone, which was negotiate in 25 flying hours spread over four and one-half days of flying. The flight is regarded as aviation's first in Washington, as being the longest cross-country trip ever attempted and successfully accomplished by standard service pursuit aerial.

Piloted by Capt. Robert W. Douglas, Jr., and Lieut. James E. Parker, the planes, which have been flying at Puerto Rico for the past 180 days, left the Zama Stationary strip, May 15, and flew to Managua the first day where the night was spent with the Marines in Nicaragua. The second overnight stop was made at Matanzas, Mexico, the third at Kelly Field, San Antonio, Tex., and the fourth at Wright Field, Dayton. The two person pilots did not leave Wright Field for Washington until late in the afternoon of May 16.

The purpose of the flight was two-fold: to develop airmail between Texas and the Canal Zone, which already had been started by the Pan-American Airways; Col. Charles A. Lindbergh and T. T. Treadwell, Director of Civil Aeronautics of War for aviators and Maj. Gen. James E. Fisher, chief of the Army Air Corps, and agreed, to bring the two pilots to "the States" to participate in the annual mailline gun and bombing contests at Langley Field.

"We had wonderful planes and wonderful engines," Capt. Douglas, a graduate of Colorado's at the Air Corps training center told Aviation's representative on landing at Belling Field. "We experienced only one or two brief periods of delay and this was due to the difficulty in getting fuel. The Nicaraguan and Mexican people were hospitable and did all in their power to make the flight a success." The world country down over, Lieutenant Parker said, was between Guatemala and Matanzas. "There was no civilization whatever below us," he said, "and aside from this area, the rest of the journey was very enjoyable."

Although the planes have been put in a severe test, they will participate in the bombing gun exercises at Langley Field against Army planes from various posts throughout the country.

### Toledo, O. By Donald G. Head

Construction of a steel and brick hangar on Toledo's new municipal airport has been completed. It is to be a modern building with the latest equipment and ample room to house the largest type of commercial planes.

Several lights have been installed under direction of F. J. Tower of the Department of Commerce, who also is inspecting the installation of state airports on the main route between Victory and Bryan, O. Contract for the construction of 52 flood lights has been awarded. The field will be free of those signs with prominent made for auto parking near highway. Recent announcement fixes the opening date at June 15.

Stockholders of the Fremont, O., Airway Corp. have an announced erection of a hangar on the flying field at Ranch Garden. Work has been started. Directors of the company are: A. H. Christy, D. LaMar Christy, Harry G. Post, H. V.

gates and Homer W. Johnson. The latter is a former Army air mail pilot and will fly the new plane which the company has purchased.

Post Clinton, O., has painted its name on the roofs of houses in both the east and west sections of the community. Harry Barr has lettered itself in letters 25 ft. high painted on the roof of the Central High School in that city.

### Memphis, Tenn.

In Clarendon Avenue

The Mississippi River has been at work for 100 years building up land on Memphis. The Memphis Chamber of Commerce Aviation Division has just completed an exhaustive survey of possession of one of a river island which has turned in what used to be the Memphis business district.

"We located" in the acquisition and developed names given to the product of Memphis' business. It is separated from Memphis proper by White River, a small tributary which might make the river opposite the city's business district. The island's widest point, on which the airport will be constructed, is only a mile from the heart of the city. It contains soil, in only a mile from the heart of the city. It contains soil, being there.

The project will cost \$2,000,000 according to estimates of the engineers making the survey. The river is making roads on the outer side of the island. Development work costing \$1,000,000 will put a stop to this, and guarantee permanency of the island.

The surface of the island will be raised above flood level by depositing soft dredged from the adjacent river channels, and supplementary grading. Government agencies have pledged their co-operation, materially reducing the tremendous expense of providing a surface high enough for permanent use. Cost of grading alone is estimated at \$400,000.

The field will be circular, a new departure in operations for such developments, 3,000 ft. in diameter. It will be hard-surfaced, the lowest point directly in the center. This arrangement will aid materially in taking off and landing the slope giving added velocity to a descending plane and helping check ramming machines. The outer rim will serve to keep out flood waters. Dredging will be supplemented by a combination of gravity and pumping stations.

The field will be used by air mail, passenger and freight lines and private aeroplanes. It will be about a mile distant from the post office. Mail will be handled as a weekly census from Memphis Airport as from either of the city's railroad stations. It is not more than 100 mi. by automobile from Detroit, because of the bumper district, and is directly opposite a large surface devoted to hardwood lumber manufacture, in which Memphis is a leader.

### Los Angeles, Calif.

By Charles P. McReynolds

Theodore T. Hall, president of the California Air Race Association, recently left Los Angeles on a flight to Mexico City for the purpose of securing the participation of Mexican government and civilian planes in the National Air Races to be held in Los Angeles during September of the year.

Mr. Hall, who is vice-president of the Pan-American Bank of Los Angeles, is also a licensed transport pilot, and is preparing to purchase another aeroplane at the Mexico City flight. He attempts at a speed record in sight, the sole purpose is to draw attention to the coming air races, now set for Mexico City, but in every town visited along the route.

The race is expected to last about three weeks and will include many important towns of the Southwestern United States, as well as most of those in Northern Mexico.

W. L. Robinson, formerly chief engineer of engines at Rockwood and March Fields and well known in flying circles,

## MILESTONES OF PROGRESS

### \$500,000 Worth of Swallows

SINCE January 1st, 1928, the Swallow Company has taken orders for a half million dollars worth of Swallows for 1928 delivery.

To meet this fast growing demand, new factory buildings have been added— quadrupling the production facilities of 1927.

If you are planning to go into the airplane business as a dealer and have not found out what the Swallow dealership has to offer, you are overlooking a good bet. Write or wire us today and we'll tell you all about it.

### SWALLOW AIRPLANE CO. WICHITA, KANSAS

## NITRATE DOPE

### NEW PRODUCTION

### IMMEDIATE SHIPMENT

Contractors to U. S. Army and Navy

VAN SCHAACK BROS. CHEMICAL WORKS  
300 ARABIANNE AVE.  
CHICAGO, ILL.

## OX5 Cylinders

Have your worn cylinders resurfaced and overhauled properly furnished.

Write for prices.

Engines and Machine Part Manufacturing  
a Specialty

Edward A. Whaley & Co.  
Norfolk, Va.



## What Do You Know About Airplanes?

**A** FEW years ago men had to learn about aircraft from personal, costly experience. They had no one to guide them—no one to point out mistakes when they were made—and therefore were soon learning what makes them work.

### Through Practical Training

Tutor the American School of Aviation offers you direct long hours of experience and knowledge, which cost millions to acquire, in their new and fascinating Home Study Course in Practical Aviation which has been highly endorsed by many aviation authorities.

#### Write Today

No matter whether you have had little or much aviation at present we are just beginning on the subject now and it is yours to learn by a complete and detailed outline of all training and can now and immediately free such "Opportunities in the Aviation Industry."

**American School of Aviation**  
Dept. 827A  
3601 Michigan Ave., CHICAGO, ILL.

  
**RELIABLE**  
HARTZELL  
PROPELLERS  
ARE RELIABLE  
20 Years Experience Behind Our Service  
HARTZELL PROPELLER CO. PIQUA, O.

Write for our new catalog No. AV 2

Helmets and  
Smart Wearing Apparel  
for men in sports shops, Stores and Women

Special clothing for  
CRAFTSMANSHIP AND GROUNDED WEAR

**IMING DRESS-EVERARD CO.**

Kalamazoo Uniform Co.  
KALAMAZOO, MICH.

THANK YOU FOR VISITING AVIATION



apple, has taken the position as chief of engine instructor for the Warren School of Aviation, Los Angeles.

Following a request from the Guggenheim Foundation for the formation of Aviators, Arctic Drugs, aerial resealant and Southern California aviation enthusiasts, but not to work separating meteorological observation stations along the Los Angeles to San Francisco air route.

Pearlie Air Transport and Madden Air Lines are now operating planes daily with that route and with the exception of Western Air Express up there service is planned to end out weather reports by radio from intermediate stations on the plane in flight.

### Galesburg, Ill.

By George T. Clark

The City of Galesburg, after consulting several expert men near the city, has decided to lease for one year \$10 more land with the option of buying it at the end of the year for \$50,000. This land is located on the south side of the new state road between Gladstone and Marion, Ill. It is one and a half miles north of the business section of the city and is bounded on the east by Park and the proposed Route 66 Business. This site was finally selected after several photographs had been taken by photographers—Chambers Field, Rockford, Ill., and also consulting W. O. Snyder of the Amherstia Branch of the United States Department of Commerce. Snyder did, however, advise a field twice the size selected, but the City Airport Commission felt that it was, at a later date, more difficult to increase it to that size.

S. W. Hagel of the city, a director of the National Aviation System of Illinois, Inc., headless of the Air King, has leased a 60 acre tract out of the city and is building hangars on it to house several planes. A compassionate plan will be adopted and a commercial flying business and air school would start at that port.

### Dallas, Tex.

By Louis E. Condon

The Dallas Chamber of Commerce is making an extensive campaign to encourage the use of the air mail. It is their desire to increase the use of the post office for the two firms of crude operators in order to attract other firms to Texas and the Southwest. Several bids have been contemplated. The campaign is being carried on by both personal contact and through the chamber area and also by the use of letters to all members of the chamber of commerce.

L. A. Wadsworth, manager of Southern Airways, received from the Seawall factory recently with a new OX-5200 plus which was delivered to the Fairchild Aircraft Service, southwest Dallas. They have placed an order for a third plane. Mr. Wadsworth says that he placed orders for two other Mississippian which will be delivered in the near future. Orders were placed with two different supply houses for midgets and parts.

### Menominee, Mich.

An airport is being used in connection with the Menominee Airport at being built on 50 acres of timber on a lake just west of town. The Menominee share, by law, is one-half of the expense. Roy Wilcox, the island, which is four and one-half miles long by three and one-half miles wide, has been developed into a summer resort at a cost estimated at several million dollars.

The airport must be ready within 30 days, and E. K. Thompson, Chicago, one of the resort promoters, said that the island association would have two or three Planes available for service between Chicago and Menominee, or directly to the island when conditions were favorable. The

land surface will have two runways, 2,800 ft. and 3,000 ft. long, respectively. The field will adjoin the mile-square gas and oil island which will be used for airplane fueling. In a fast flight across a round trip between Chicago and the island it would take five hours.

### St. Paul, Minn.

Walter T. Varnay, our great contractor on the St. Louis-Brown-Peterson runway, with Mrs. Varnay and other relatives and friends, recently visited Minneapolis as an inspection tour of the Varnay Air Lines. From here the party continued on to Duluth, traveling in a seven passenger sedan.

Varnay will soon make the flights here from St. Paul on a new three passenger Stearman plane he has ordered. The trip will then require but six hours, states Charles T. Wrightson, business manager of the Varnay Air Lines. The Varnay company is now using four Stearmans in flying mail between St. Louis City and Duluth.

Official announcement that Bemis has been selected as a competitor for the first "American Air Journal," and that the first issue is scheduled to arrive here on the afternoon of July 12, was received recently by the Bemis Chamber of Commerce. The success of planes will carry approximately 200 tourists 1820 mi., stopping at 32 cities.

### Schenectady, N. Y.

Construction of a second hangar at the Schenectady Airport will be started immediately, according to an announcement by Capt. James A. Walsh, a director of the airport. The building will be of brick and steel construction.

The first hangar on the airport, built some months ago, was filled to capacity a few weeks after completion, making necessary the erection of a second building to meet present demands.

Rention of a third hangar is being planned by General Weather Airways, holder of the Albany-Cleveland air and contract for three new. Plans for the building, to be a single story incorporating several generations of designs, are now being drafted by engineers of the American Aeroplane Corp.

The new building will provide for the utilization of all possible space. In addition to a storage area and shop, there will be accommodations for classrooms for private instruction and other features.

### Fair Haven, N. Y.

Plans following the south shore of Lake Ontario are being developed to look over the new airport area. It is located one mile south of Fair Haven Bay and the village of Fair Haven. The field can be easily located from the air as there are low ridges, one east and west 1000 ft. long and the other south-east by north 2000 ft. long. Private roads can be found in the area of the new airport. At the present time the only plane on the field is the Air King owned by H. R. Astor. From the indications shown by the people in this section it is expected that more planes will be added soon.

### Hamilton City, Ohio.

By Ernest W. Fox

H. C. Morris, local aviation booster and chairman of the chamber of commerce aviation committee for some time, has now a bid to award the winner of overall place in the national skydiving building contest now being conducted by the Daily Journal of Aviation. First prize is to be a free trip to Detroit, Mich.

Hamilton now has 40 air fields. These, listed here below, may be used to start meeting this new Aviation Fellowship. Brookfield, Chillicothe, Chillicothe, Cincinnati, Springfield, Clinton, Dayton, Frost, Fort Hill, Harrisonburg, Marietta, McAllister, McLeod, Miami, Mat-



Powered and Passaic Pending

## Yes, All Metal but the Tires

Model "G" OX-5 \$555

Write for details

**Lenert Aircraft Co.**  
Peninsular, Michigan

### TITANINE

Registered Trade Name

#### A Complete Range of AIRPLANE FINISHING MATERIALS

Super-polished paint, black, white, aluminum or gold.

Clear varnish and matte enamel.

Tricolor enamel, lacquer, dope.

Pigmented enamel, dope.

Flexible varnish lacquer.

Wood and metal lacquer (For inside and outside finish).

**TITANINE, Inc.**

Union, Union County, New Jersey

Contractors to the United States Government



HAMILTON AIRPORT 400-41 East Ave.,西湖村, 中国

HAMILTON AIRPORT 400-41 East Ave.,西湖村, 中国









# A New Enlarged Aviation Manual

**Free to Pilots and others interested in aviation—**



A revised manual that discusses authoritatively and impartially airplane motors, aero gasoline and oil . . . A manual that gives tables and tests . . . An airway guide that lists the airports and landing fields throughout the Middle West . . . the names of 1,800 towns and cities where this company has painted on its wave-houses the names of the respective communities to aid aviators.

Everyone who has seen a copy of this new sixty-nine page Aviation Manual comments upon the thorough manner in which it covers its subjects.

Your copy will be sent free upon request.

## Stanolind Aviation Gasoline and Stanolind Aero Oil

The gasoline satisfaction of aviators using these two products is due primarily to two things:

First—they perform their functions in such a manner that with thousands of flying hours to their credit, never has there been a single engine failure traceable to faulty combustion or incomplete lubrication.

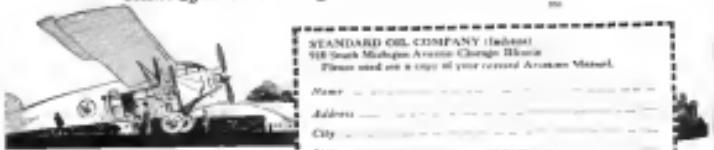
Second—Standard Oil Company (Indiana) Service Stations throughout the Middle West are prepared to render service at practically all landing fields.

A map showing these landing fields is included in the new Aviation Manual.

**STANDARD OIL COMPANY**

General Office: 910 S. Michigan Ave.

CHICAGO, ILLINOIS



THANK YOU for visiting AVIATION

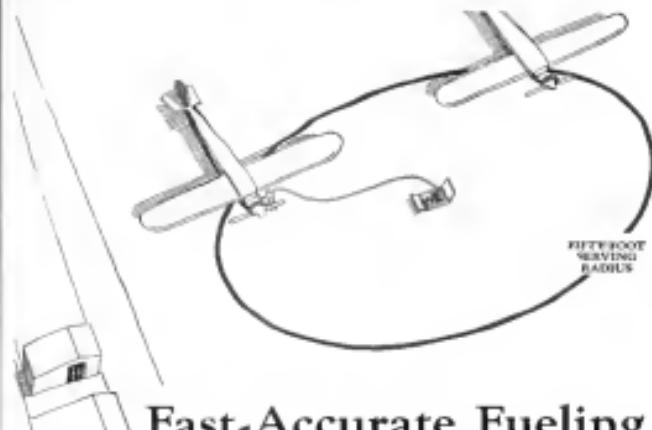
STANOLIND COMPANY (Indiana)  
910 South Michigan Avenue Chicago Illinois  
Please send me a copy of your revised Aviation Manual.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_



## Fast-Accurate Fueling

In today's race of civilization, airplanes are called on more and more to speed up transportation of people, freight, and mail.

Airplanes are fast enough in the air, but certain airports have poorly designed and efficient servicing units for landing, much valuable time is lost. To overcome this loss Bowser has designed a system for complete and fast servicing of airplanes.

This "service-pit" can be located at any convenient point on the field, and planes then "turn" up to within 50 feet of the pit and are then serviced with gas, oil, air, or water.

Dollies are controlled by the handle or valve on the end of each leg. All piping and valves are put into operation by the use of vapor-proof switches to "service pit." Accurate measurement is maintained by Bowser "Xacto" Meter—the most accurate pipe line meter ever produced.

Bowser's "service-pit" is what the aviation world has needed. It eliminates waste and downtime. It insures efficient re-fueling. It is seven-eighths when closed. It is built to withstand heavy plane taxiing over it. For more complete details write us, or call in a Bowser man.

## AIRCRAFT FUELING SYSTEMS



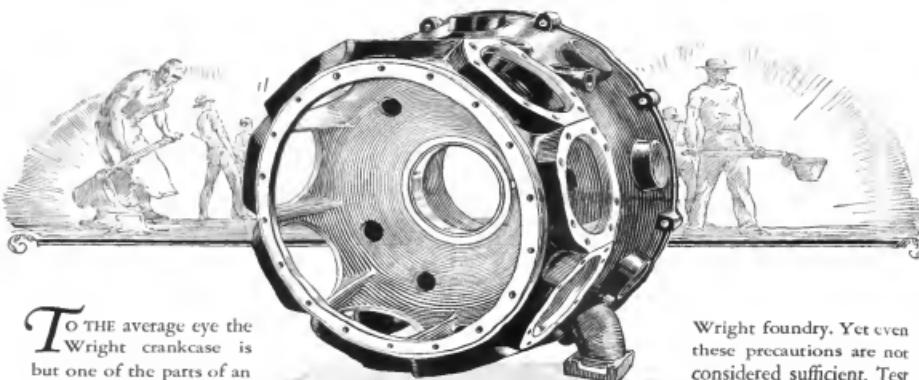
The "service-pit" gives fast refueling and accurate servicing of airplanes without the need for support from the side of the pit.

S. F. BOWSER & CO., Inc.  
1306 Creighton Avenue,  
Fort Wayne, Indiana

Give me full details on the "Service-Pit."

Name \_\_\_\_\_

Address \_\_\_\_\_



TO THE average eye the Wright crankcase is but one of the parts of an aircraft engine, but in no part of any modern mechanism is sound design more apparent or skillful workmanship better exemplified.

To the metallurgist, engineer, foundryman or machinist, it is remarkable that a casting of such size can be so tough and durable...yet so light...so strong and rigid...yet comprised of such thin sections.

It is not by chance that it is known as "the finest aluminum casting made". From the specification of the alloy to assembly of the finished part in the engine, the Wright crankcase is held to the most rigid of standards.

Only the best metals of the world are used; the mixing of the alloy itself is done with exacting care; remelting of scrap is unheard of in the

Wright foundry. Yet even these precautions are not considered sufficient. Test bars, poured from each crucible of molten alloy must pass rigid chemical and physical tests or the entire heat of metal is rejected.

Nor does this vigilance relax when once the crankcase is cast. There must be no internal stresses in the metal, no porous areas, no unseen cracks or defects. Each unit is heat-treated to assure full strength of all sections, thick or thin; each is tested under water by air pressure that no porous passages may exist; each

is etched in acid that no minute defects may pass unnoticed.

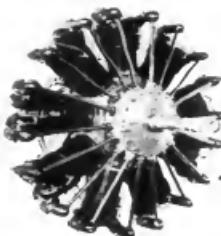
For more than a decade Wright has been building engines with just such care as this...to produce aircraft powerplants that measure up to the highest standard of excellence...an unchanging policy which explains Wright engine performance.

*More Pilots fly them!*

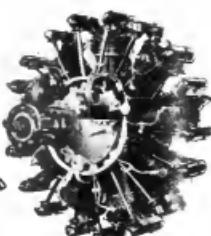
# WRIGHT

WRIGHT AERONAUTICAL CORPORATION

PATERSON, N. J., U. S. A.  
CANADIAN WRIGHT LIMITED, Sole Licensees for Canada, Montreal.



Wright "Cyclone"  
Aeronautical  
Engine



Wright "Whirlwind"  
Aeronautical  
Engine